THE IRON TRADE REVIEW

Volume XL CLEVELAND, MAY 23, 1907 Number 21

MANY CONTRACTS

MADE BY AGRICULTURAL IMPLEMENT MAKERS

For Steel Bars.—Pig Iron Active in the East and at Pittsburg.—Amalgamated Workers Demand Wage Increases.

The buying of pig iron has been very active during the past week in the east and in the Pittsburg district. In other parts of the country, transactions have not been so numerous as during the preceding two or three weeks, and there is a strong conservative feeling. Conditions resemble somewhat those of the fall of 1902 when spot prices were extremely high and contracts were being made for delivery from 12 to 16 months in the future, but the slump which came late in that year has not been forgotten, and neither sellers nor buyers are anxious to force the market at the present time. At tidewater ports, the unloading of cargoes has been delayed by the longshoremen's strike. Arrangements for importing considerable tonnages of pig iron have recently been made, but advancing freight rates, higher quotations in England and difficulty in obtaining dock room for loading the Middlesboro product may retard the movement.

Very Heavy Specifications

In finished lines new business is not uniformly of large volume, but specifications are extremely heavy. About 70,000 tons of steel rails were ordered last week in the Chicago district and about 12,000 in Pittsburg. Implement manufacturers have been prominent in the market, contracting for steel bars at full rates for the year's requirements. Other buyers of steel bars have also placed orders freely, but bar iron continues to show weakness. Another advance in merchant pipe is expected, but has not yet been announced. Although large tonnages of structural steel are pending, particularly in Chicago and in the east, mills, as a rule, are not so well supplied with orders for shapes as for other finished products, and deliveries can be made with comparative ease. The demand for wire products continues very active and the pressure upon deliveries is strong.

Higher Wages Demanded

The Amalgamated Association of Iron and Steel Workers at its recent convention in Toledo decided to demand advances on nearly all kinds of work done by its members. These demands will be submitted to a conference of employers and employes. The backbone of the strike of employes of lake ship yards has been broken.

Higher Prices for Boilers

Following the announcement made two weeks ago of advances in prices of engines, we are advised that boiler manufacturers are taking similar action, due to high prices demanded for plates for anything like prompt delivery, and also to increased labor costs. A number of independent mills are now receiving $40 per ton for tank plates, and contracts for delivery during the last half of the year are being freely made at $38.

Weakness of Coke

There is continued weakness in coke, especially for spot delivery, as production has been in excess of demand. The low prices for spot have had a tendency to discourage contracting and very little business is being done in either foundry or furnace grades. The old material market shows indications of improvement in some centers, but there is still considerable irregularity.

LARGE ATTENDANCE

AT THE AMERICAN FOUNDRYMEN'S CONVENTION.

Seventy Manufacturers Make Displays.—Rapid Increase in Membership of Association.—Foremen Meet.

(Special Telegram.)

Philadelphia, Pa., May 21.—An enrollment of 1,200 foundrymen, representing every state in the union and Canada, proclaims the success of the twelfth meeting of the American Foundrymen's Association now in session in Philadelphia, the birthplace of the society. The tremendous development of the industry in recent years is reflected in the displays which crowd every nook of the Second Regiment armory and overflow into an adjoining tent. No less than 70 manufacturers of equipment and supplies are represented, and the new types of molding machines displayed represent progress, unparalleled in the history of the foundry trade. Early Monday morning, the exhibits were ready for the inspection of the visitors, although the convention was not formally opened until Tuesday morning. The assembly hall proved none too large for those who wished to attend the opening session, and notwithstanding the displays, great interest was manifested in the proceedings. Hon. John E. Reyburn, mayor of Philadelphia, in an eloquent address welcomed the foundrymen to the City of Brotherly Love, and Thomas Devlin, president of the Philadelphia Foundrymen's Association, and Dr. E. E. Brown, chairman of the entertainment committee, likewise extended hearty greetings to the American Foundrymen's Association and Foundry Supply Association, and response was made by Presidents W. H. McFadden and S. T. Johnson.

Although many recommendations were contained in the presidential address, published in full on pages 835-837 of this issue, including an increase in dues to $10, no action was taken at the morning session.

(Continued on page 812.)

THE WEEK IN IRON CENTERS.

PITTSBURG.

Agricultural Interests Buying Bars More Freely.—Pig Iron Active.

Office of THE IRON TRADE REVIEW, 521 Park Bldg., May 22.

Aside from the pig iron situation and the continued scarcity of semi-finished material, the feature of the market during the week under review has been the prominence in the market of the agricultural implement makers of the central west. It is estimated that their requirements for the year beginning July 1 will be somewhere between 260,000 and 300,000 tons. Of this about 50,000 tons have already been contracted for at the full card rate with extras. With the discussion of the various railroads concerning their 1908 rail specifications before placing contracts for their requirements a small tempest has been stirred up as to the relative merits of Bessemer and open-hearth rails and the Steel Corporation, as well as independent rail makers, have expressed a willingness to co-operate with the railroads in securing the best possible material. The breaking of a large number of Bessemer rails on high speed tracks under heavy equipment has led to a very thorough investigation, the result being a partial understanding that present standard rails are not heavy enough or of proper shape to withstand the burden placed upon them. The first important step this year toward eliminating the difficulty was the placing by the Louisville & Nashville railroad and by the Harriman interests for its Illinois Central lines of large tonnages with the Tennessee Coal, Iron & Railroad Co. for open-hearth rails. The United States Steel Corporation at the present time has no open-hearth rail equipment, but by the beginning of 1909 with the new Gary, Ind., plant and the Ohio works of the Carnegie Steel Co., at Youngstown, O., making open-hearth rails it will have an annual capacity of 750,000 tons. As yet no provision has been made toward converting the Edgar Thomson plant, the largest rail mill of the corporation into an open-hearth plant. This change would take about two years.

There has been no change in the situation as far as any of the finished lines are concerned. The extremely heavy demand for merchant pipe and boiler tubes, as well as plates and steel bars, continues while on iron bars, sheets and tin plate the new business has been comparatively light, although specifications with urgent requests for immediate delivery are unusually heavy. The scarcity of semi-finished steel continues unabated with practically none of it to be obtained in the market and with at least two of the large producers entirely out of the market.

Pig Iron.—Foundry iron has been active in a quiet way, a great many of the inquiries not being sent out as is usually the custom, but individual inquiries to producers and brokers have been more numerous than for several weeks past. The tonnages have been comparatively small. Sales reported during the week are two 1,000-ton lots of Bessemer for June at $23.50 furnace, 1,000 tons May basic $24.00, 500 tons May Bessemer at $24. There is an inquiry in the market for 3,300 tons chilled Bessemer for last half, which has not been placed and there are several other consumers who have been trying to get iron. Although the two large southern interests announced a week ago that they were out of the market for last half deliveries, some southern iron is now being offered for last half on a basis of $21 Birmingham, an advance of $1 on southern No. 2 since last week. Northern No. 2 foundry for spot delivery is quoted nominally at $26 valley, although several carload lots have been sold as high as $30 valley. Prompt Bessemer and basic are nominally quoted $24. A sale of Bessemer malleable 1,000 tons per month through the first half of next year has been sold in this district at $22 valley furnace and a report from Cleveland says that 25,000 tons has been sold there at the same price. Gray forge iron for last half delivery is quoted $22.50 valley. On last half delivery we quote as follows:

Bessemer, Valley	$23.00 to 23.50
Bessemer, Pittsburg	23.90 to 24.40
No. 1 Foundry, Pittsburg	23.90 to 24.40
No. 2 Foundry, Pittsburg	23.90
Gray Forge, Pittsburg	22.40 to 22.90
Basic, Valley	23.00
Basic, Pittsburg	23.90

Ferro-Manganese.—This market has not been active in the Pittsburg district and on forgings 80 per cent ferro-manganese for prompt delivery we quote $69 to $70 delivered Pittsburg, and for delivery through the last half of the year $66.50 to $67.50. There has been a considerable dealing in the eastern market at about the same price.

Imported 50 per cent ferro-silicon is quoted $110 Pittsburg; domestic 12 per cent, $36; 11 per cent, $35; 10 per cent, $34; with the lower grades imported ferro-silicon, $1 higher.

Muck Bar.—On all pig metal muck bar we quote a nominal market at $37.50 to $38, and on part scrap bar, $36.50 to $37.

Plates.—The past two weeks has seen a larger inquiry for steel tank plate for future deliveries than during the same period for two months past. This is largely due to the inquiry for very heavy tonnage by a western railroad for oil storage tanks in the southwest. The official price of 1.70c base f. o. b. mill Pittsburg with extras is still quoted by mills for such deliveries as can be made, these being not before August or September, and in many cases much later than that. For reasonably prompt delivery the market is 1.80c to 1.90c on tank plate 6¼ to 100 inches. Reports indicate an early settlement of the ship yard strikes on the lakes and the two plants of the Great Lakes Engineering Co. at Ecorse and St. Clair, Mich., are in operation. The action of the Pennsylvania R. R. Co. in placing 235 steel passenger coaches is the first big step toward the use of steel in this line, although the Southern railway already has a steel passenger coach and the Erie R. R. several mail cars. Of this order the Pressed Steel Car Co. got 85 cars, the American Car & Foundry Co. 90 cars and the Pullman Co. 50 cars. We quote the following base prices f. o. b. mill Pittsburg with usual extras:

Tank plate, ¼-inch thick, 6¼ to 100 inches, 1.80c to 1.90c f. o. b. mill Pittsburg. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c. A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than four inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1.00c. Gages under ¼-inch to and including 3-16-inch plate on thin edges, 0.10c; under 3-16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—The volume of new business would indicate that the majority of consumers have covered for their requirements for the contract period, as comparatively little new business is being placed. On the other hand, contracts already placed are in many instances fully specified. Specifications at

this time are greater in proportion to the contract tonnage than for several years past, and the chief concern of consumers is to secure deliveries. Independent mills in position to make reasonably prompt shipments are securing from $1.50 to $2.00 premium on base sizes, although the leading interest has not changed its prices on any of the lines. The new sheet mill of the La Belle Iron Works at Steubenville, O., will be in operation about July 15 and will have a capacity of about 2,000 tons per month from that time. We quote the following official list:

Black steel sheets one pass, cold rolled, Nos. 11-12, 2.20c; Nos. 13-14, 2.25c; Nos. 15-16, 2.30c; Nos. 17-21, 2.35c; Nos. 22-24, 2.40c; Nos. 25-26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No. 29, 2.75c; No. 30, 2.85c; galvanized, Nos. 10-11, 2.65c; Nos. 12-14, 2.75c; Nos. 15-16, 2.85c; Nos. 17-21, 3.00c; Nos. 22-24, 3.15c; Nos. 25-26, 3.35c; No. 27, 3.55c; No. 28, 3.75c; No. 29, 4.00c; No. 30, 4.25c. Corrugated roofing, $1.85 per square for No. 28 painted, 2½-inch corrugation, and $3.25 per square No. 28.

Tin Plate.—While some new tin plate business has been placed for third and fourth quarter during the past week, the tonnage has not been large. Practically all of the large consumers have covered for their requirements and mills are now working practically to capacity endeavoring to make shipments according to specifications. As far as can be learned, no premiums are being paid on tin plate. The McKeesport Tin Plate Co., McKeesport, Pa., has announced its intention to increase the size of its plant by adding six new mills, making a 16-mill plant. We quote the following official prices:

Coke tin plate, 100-pound basis, 14 x 20, $3.90 f. o. b. mill, Pittsburg district. Terms, 30 days, less two per cent for cash in ten days.

Rails and Track Material.—The sales of standard sections closed by local mills during the past week amounted to between 12,000 and 13,000 tons, all for 1907 delivery, and the light rail tonnage taken on amounted to about 3,000 tons. As far as can be learned, no 1908 business has been taken during the week by local mills. An estimate of 1908 business already on the books by the local interests is 75,000 tons, and by the Illinois Steel Co. in the neighborhood of 20,000 tons. There is considerable mill capacity still untaken for the present year. We quote:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $40; 12-pound, $36 to $37; 16-pound, $35 to $36; 20-pound, $34 to $35; 25 to 45-pound, $33 to $34; angle splice bars for standard sections, $1.65; spikes for forward deliveries, $2.50.

Hoops, Bands and Cotton Ties.—The movement in cotton ties during the week under review has been slow, and this is accounted for by the fact that the first three weeks after the opening of the market saw a very heavy movement and between 1,500,000 and 1,700,000 bundles have been sold in the south. From now until October or November the market will move slowly until a more accurate estimate of the cotton crop and tie requirements is possible. Some new hoop and band business is being received, although the large buyers, notably the cooperage interests, are not expected to make their yearly contracts until just prior to July 1. We quote as follows:

Hoops in carload lots, 2c; in less than carload lots, 2.10c; bands, 1.60c; base half extras as per standard steel; cotton ties, 95c per bundle.

Merchant Bars.—The feature of the bar market during the past week has been the large volume of business in steel bars placed by the implement manufacturers covering their requirements for the year beginning July 1. The estimate of the week just past is a little under 50,000 tons, all of which was placed at the full card 1.60c base Pittsburg, and extras. The requirements for the implement interests for the year are variously estimated at between 260,000 and 300,000 tons. For quick shipment from the mills, local interests are securing 1.80c to 1.90c base Pittsburg, this covering shipments within five to six weeks. Bar iron has been moving slowly during the week and prices are strong at 1.75c to 1.80c base Pittsburg, for Pittsburg consumption, and 1.60c to 1.65c base Pittsburg, plus freight to point of shipment for western deliveries. The weakening factor in the local market that temporarily broke prices a few weeks ago is now filled up and is no longer in the market. We quote as follows on business for future deliveries:

Common iron bars, 1.75c to 1.80c Pittsburg in carload lots and over; 1.80c to 1.85c in less than carloads; Bessemer steel bars, 1.60c, net; plow and cultivator, 1.60c, net; channels, angles, zees, tees, under three inches, 1.70c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 50 per cent off in carload lots, and 5 per cent off in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. The price of planished and machine straightened tire is 1.80c, base, half tire extras. Iron finished tire up to 1½ inch and over to be sold on regular bar basis of 1.60c base, half extras, steel card.

Structural Material.—Specifications against mill contracts are normal and nothing out of the ordinary. While the larger erecting and constructing companies are comfortably filled up for several months to come and not quoting on the routine run of small inquiries now being received, one or two of the smaller interests are in need of work and price competitions have been very sharp. Shape mills are in a position to make deliveries on a full range of rollings in from seven to nine weeks and could easily take on without congestion a great deal more business. We quote as follows:

Beams and channels, 15-inch, and under, 1.70c; over 15 inches, 1.80c; zees, 1.70c; tees 1.70c; angles from three to six inches inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.80c base.

Wire and Wire Nails.—There has been no change in this market and the pressure for deliveries is just as heavy as it has been for several months. Local interests are making practically no effort to secure new business inasmuch as the orders by mail and voluntary offerings are ample in tonnages to make solicitation unnecessary. There is a very heavy demand for wire nails and plain fencing. We quote as follows:

Wire nails, jobbers' carload lots, $2; retailers' carload lots, $2.05; less than carloads, $2.10; painted barb wire, $2.15, for jobbers in carloads; retailers in carloads, $2.20; and less than carload, $2.30, with 30c for galvanizing; plain wire, $1.85 for jobbers, and $1.90 by carload.

Merchant Pipe.—Although an advance of another point was expected, the leading interest made no announcement so far this week of its intentions. The steady volume of business is being received at the card discounts announced last week. As far as can be learned, the inquiry of the Ohio Fuel Gas Co. for 75 miles of 18 inch line pipe will not be submitted to pipe mills for several months as the survey has not been made and the grant was obtained only a week ago. New inquiries are coming in at a lively rate and a few of the larger ones are 10 miles of 12 inch and 40 miles of 3 to 13 inch line pipe. We quote the following official discounts to consumers, with jobbers' discounts one point higher:

	—Steel—	
	Black.	Galv.
⅛ and ¼ inch	65	49
⅜ inch	67	53
½ inch	69	57
¾ to 6 inches	73	63
7 to 12 inches	70	55

EXTRA STRONG PLAIN ENDS.

⅛ to ⅜ inch	58	46
½ to 4 inches	65	53
4½ to 8 inches	61	49

DOUBLE EXTRA STRONG PLAIN ENDS.

½ to 8 inches	54	43

Iron Pipe.—The extreme discount of the largest producer to consumers is 67 and 5 on iron pipe Conditions have not changed and there is a big demand. We qoute:

RANDOM LENGTHS WITH THREADS AND COUPLINGS —CARLOAD LOTS.

	Blk.	Gal.
⅛, ¼, and ⅜ inch	59	43
½ inch	62	51
¾ to 6 inches	67	57
7 and 8 inch	62	46
PLUGGED AND REAMED.		
1 to 4 inch	65	55
CUT THREE TO SIX FEET.		
⅛, ¼, and ⅜ inch	55	39
½ inch	58	47
¾ to 6 inch	63	53
7 and 8 inch	58	42

Boiler Tubes.—The demand for boiler tubes continues at about the same rate with a slight increase in the urgent business for locomotive and merchant boiler tubes. We quote:

	Iron.	Steel.
1 to 1½ inch	42	47
1¾ to 2¼ inch	42	59
2½ inch	47	61
2¾ to 5 inch	52	65
6 to 13 inch	42	59

2¼ inches and smaller, over 18 feet, 10 per cent net extra.
2¾ inches and larger, over 22 feet, 10 per cent net extra.

Coke.—The weakness in coke evident for the past six weeks is still in force with but very little prospect of a change before the beginning of the third quarter. Furnace coke for spot shipment is quoted $2.10 to $2.20 at the ovens and on contract for last half delivery $2.35 to $2.45, and many operators are willing to sell their output at these figures, while a few of the more optimistic are holding for $2.50 minimum on contract furnace coke for last half and find that the larger interests have been able to secure coke for their requirements at the lower figure. Some spot coke has been sold at $2. Considering the number of buyers who have not covered for last half, there are very few inquiries in the market, the impression evidently being that the coke market will not stiffen up materially before July 1. Standard Connellsville foundry coke for spot shipment is quoted $3 to $3.25 and on contract for last half the same prices are named.

Old Material.—Based on the increased price of pig iron for prompt and last half deliveries, brokers in scrap iron during the week under review have shown an inclination to speculate on an advance in scrap. This is confined almost entirely to heavy melting scrap and as high as $18.50 to $18.75 has been paid for this material delivered in the Pittsburg district. With this wave of anticipated higher prices, old material has not been coming out as freely as heretofore and producers as well as brokers are holding their stocks more closely. As far as consumers are concerned, there is very little doing and the inquiry in the market at this time for heavy melting stock does not run more than 2,000 to 3,000 tons and prices quoted are too high for consumers. For delivery in the Pittsburg district we quote as follows:

Heavy melting scrap, $18.25 to $18.50; re-rolling rails, $19 to $19.50; bundled sheet scrap, $15.75 to $16.25; iron axles, $30.50 to $31; old iron rails, $23 to $23.50; No. 1 wrought scrap, $19 to $19.25; old car wheels, $24.50 to $25; low phosphorus scrap, $22.50 to $23; machine shop turnings, $15.25 to $15.75; axle turnings, $16.25 to $16.50; cast borings, $13.25 to $13.75; No. 1 cast scrap, $21 to $21.50.

CHICAGO.

Pig Iron Prices Firm.—Heavy Business in Finished Lines.

Office of THE IRON TRADE REVIEW,
1362 Monadnock Block, May 21.

New business and current specifications continue at high water mark. Rail contracts placed with the local mill during the past week aggregate 70,000 tons. Implement orders for steel bars and pressed shapes are a close second, contracting for these being unusually heavy. The large tonnage of structural steel up for figures, as mentioned last week, has been supplemented by requests for figures on 15,000 tons additional. The year is expected to establish new records in the consumption of this material. Another inquiry for 1,000 tons of riveted pipe has been received from the far west, making the total tonnage now before makers close to 50,000. The advance of 30 cents a ton in the freight rate on finished material from Pittsburg to Chicago, heretofore announced in THE IRON TRADE REVIEW becomes effective June 1. Pig iron is without price change, the only notable feature being inquiry for next year's shipments. The scrap market is strong and prices have an upward tendency.

Pig Iron.—With a moderate volume of business under negotiation, prices on pig iron have remained firm. The stability of the market at the present level of prices has been further enhanced during the week by sales of malleable Bessemer for deliveries running into the first quarter of 1908, and by inquiries for southern iron for shipments through the first half of next year. On the malleable transactions, $25 Chicago was the basis on which the orders were entered, and $18.50 Birmingham for No. 2 foundry was named on the inquiries for southern iron. The week past has seen a light movement in southern iron either for spot shipment, or for delivery in the last half. This is attributed to the absence from the market of the two largest Birmingham factors—the Tennessee and Sloss companies, and to the further fact that buying of southern grades has been extremely heavy in the past few weeks. The Sloss withdrawal is considered only temporary, and as soon as its order books are balanced and its idle furnaces in blast again, it is expected to have iron to offer for the last half. Northern furnaces have received the bulk of the tonnage placed in the current week. Malleable Bessemer, especially, was active. Standard Bessemer has advanced 50 cents a ton, and is now quoted at $25.80 Chicago. A brisk demand has been felt for high silicon irons, and Jackson county and southern silveries are firm at the prices given below. A round tonnage of 7 per cent southern silvery for the third quarter was made on the basis of $29.85 Chicago. No inquiry is felt for basic, but the Virginia product remains strong at $24 furnace, or $27.10 Chicago, nevertheless. Our quotations are for the last half, the minimum being for the fourth quarter and the maximum for the third quarter:

Lake Superior charcoal	$ 27.50
Northern Foundry No. 1	25.50
Northern Foundry No. 2	25.00
Northern Foundry No. 3	24.50
Northern Scotch Foundry	25.50
Ohio Strong Softeners No. 1	24.80 to 25.30
Ohio Strong Softeners No. 2	24.30 to 24.80
Southern Foundry No. 1	24.85 to 26.35
Southern Foundry No. 2	24.35 to 25.85
Southern Foundry No. 3	23.85 to 25.35
Southern Foundry No. 4	23.35 to 24.85
Southern No. 1 Soft	24.85 to 26.35
Southern No. 2 Soft	24.35 to 25.85
Southern Gray Forge	23.35 to 23.85
Southern Mottled	22.85 to 23.35
Southern Silveries, 4 per cent to 6 per cent Silicon	26.85 to 28.85
Jackson Co. Silveries, 6 per cent.	29.40 to 29.90
Jackson Co. Silveries, 8 per cent.	30.40 to 30.96
Jackson Co. Silveries, 10 per cent	31.40 to 31.90
Malleable Bessemer	25.00

Billets and Rods.—With transactions limited to such lots as mills can furnish, quotations on billets and rods are of a nominal nature. Each inquiry is quoted on or declined, according to its individual merits. The lowest prices ruling, however, are $36 Chicago for forging billets, and $37 Pittsburg for rods.

Iron and Steel Bars.—No cessation is noted in the contracting for steel bars. Some large orders have been taken in the past week, the buyers including the smallest to the largest consumer. The aggregate tonnage closed is of gratifying proportions to producing interests. Specifications are voluminous, but deliveries are not to these requirements. Mills manufacturing bar iron and steel, have

been asked to substitute the former if immediate shipment on specifications for the latter cannot be given. Bar iron is unchanged at a spread of 1.60c to 1.65c Pittsburg, but there is an increasing tendency to quote the lower price on tonnages that heretofore have commanded the higher figure. The advance of 30 cents a ton in the freight rate between Pittsburg and Chicago, effective June 1, has necessitated a revision in our quotations. We have changed these as follows: For Chicago deliveries, soft steel bars and bands, 1.78c half extras; soft steel angles, less than 3 x 3, 1.88c; hoops, 2.18c, base, full extras. Bar iron from local stocks, 2.25c full extras; soft steel rounds and squares, 3 in. and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by ⅛ inch and larger, $2 per 100 pounds base; 4½ inches by 5 inches and 6 inches by 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands, $2 half extras; soft steel hoops, $2.40 to $2.50 full extras. Other sizes not mentioned above, $2 per 100 pounds base, plus half extras.

Plates.—An inquiry for 1,000 tons of riveted pipe has been received from Walsenburg, Colo. None of the inquiries for this material previously mentioned has been let, but active figuring on all is proceeding. No change in mill conditions is noted. Producers are crowded with orders and specifications, and deliveries on contracts are proceeding slowly. For immediate shipment, 2c Pittsburg is secured without difficulty, and 1.80c to 1.90c is asked for delivery a couple of weeks after receipt of order. Business is exceedingly plentiful. We quote as follows:

Plates, ¼ inch and heavier, 6¼ to 100 inches wide, either universal or sheared, 1.70c to 2c Pittsburg base. For extras see Pittsburg report. Freight rate to Chicago, effective June 1, 18c per 100 pounds for carload lots, and 20c per 100 pounds for less than carload lots. Jobbers' prices for shipment from local stocks are as follows: Tank steel, ¼ inch and heavier up to 72 inches wide, 2.20c; 3-16 inch up to and including 60 inches wide, 2.30c; 3-16 inch 72 inches wide, 2.55c; No. 8 up to 60 inches wide, 2.50c. Flange steel, 25c extra; heads, 25c extra.

Sheets.—New tonnage and specifications for sheets continue active. Mills have slightly bettered their position on deliveries in the last few weeks, but there is yet much room for improvement. Premiums are still in vogue for prompt shipments. Quotations below are subject to this reservation. We quote as follows:

Black sheets, Nos. 8, 9 and 10, 1.90c Pittsburg; No. 28, 2.60c Pittsburg. Galvanized sheets, No. 28, 3.75c Pittsburg. Freight to Chicago, 18c per 100 pounds for carload lots, and 20c for less than carload lots. Jobbers' prices on carload lots and less from store are as follows:

No. 10, 2.50c to 2.55c; No. 12, 2.55c to 2.60c; No. 14, 2.60c to 2.65c; No. 16, 2.70c to 2.80c; Nos. 18-20, 2.80c to 2.90c; Nos. 22-24, 2.85c to 2.95c; No. 26, 2.90c to 3c; No. 27, 2.95c to 3.05c; No. 28, 3.05c to 3.15c; No. 30, 3.35c to 3.45c. Galvanized sheets, No. 10 to 20, 3.50c to 3.55c; Nos. 22 and 24, 3.65c to 3.75c; No. 26, 3.85c to 3.90c; No. 27, 4.05c to 4.15c; No. 28, 4.25c to 4.35c; No. 30, 5.40c to 5.45c.

Structural Steel.—Only one of the structural contracts mentioned last week has been let; that is the brew house for the Schlitz Brewing Co., 400 tons. This was taken by the Modern Steel Structure Co., Waukesha. The American Bridge Co. and Pennsylvania Steel Co. also closed railroad contracts during the week for an aggregate of 5,000 tons. New jobs to come up for figures include a railway bridge for the Chicago & Northwestern at Clinton, Ia., 7,500 tons; lift bridge for the same railroad over the north branch of the Chicago river, 900 tons; new shed and warehouse for Joseph T. Ryerson & Son, 1,300 tons; and annex to Mills building, San Francisco, 1,100 tons.

The American Bridge Co. is also figuring on river barges for Memphis and St. Louis deliveries, involving an aggregate of 1,600 tons, and for beet sugar tanks in Utah and Idaho, of an aggregate of 3,000 tons of plates and shapes. Mills report a satisfactory volume of new business and specifications, with rolling schedules filled for the next six weeks. Prices are without change, as follows: Beams and channels, 3 to 15 inches inclusive, 1.70c Pittsburg. For extras see Pittsburg report. Freight rate from Pittsburg to Chicago, 18c per 100 pounds for carload lots, and 20c per 100 pounds for less than carload lots. Quotations from store are as follows:

All angles, three inches and larger, including six inches, $2.10 per 100 pounds; angles over six inches, $2.15 per 100 pounds base; beams, three inches to 15 inches, inclusive, $2.10 per 100 pounds base; channels, three inches and larger, $2.10 per 100 pounds base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—Rail orders placed with the Illinois Steel Co. for 1908 shipment in the past week, aggregate 70,000 tons. The Tennessee Coal & Iron Co. also took an order for 10,000 tons of open-hearth rails from an interest in this territory. Track supplies for next year are not being booked at this time, the buying of these usually commencing after the rail books are filled. There is a better demand for light rails, and it is doubtful now if the proposed change in prices mentioned last week will be made. We quote as follows:

Bessemer rails, $28 to $30; less than 500-ton lots, $32; open-hearth rails, $29; light rails, Bessemer, 30 to 45-pound sections, $35; 25-pound, $36; 20-pound, $37; 16-pound, $38; 12-pound, $39, and lighter sections down to 8-pound, $45.50, all f. o. b. mill. Track supplies vary in price according to quantity and delivery. On orders accompanying rail contracts for future delivery, we quote angle bars, 1.65c; spikes, 2.35c; bolts with square nuts, 2.65c; with hexagon nuts, 2.80c. For carload lots or less, for prompt shipment, the following prices are asked: Angle bars, 2.25c to 2.75c; spikes, 2.60c to 2.70c; bolts with square nuts, 2.85c; with hexagon nuts, 3c.

Merchant Steel.—Further contracts are reported from the implement trade. The buying from this source is in full swing, and the total tonnage for July to July requirements closed to date is very large. Specifications are active. We have revised our prices to include the higher freight rate, effective June 1, and quote as follows: Planished or smooth finished tire steel, 1.98c; iron finish, up to 1½ x ½ inch, 1.93c base; iron finish, 1½ x ½ inch and larger, 1.78c base; channels for solid rubber tire, ¾ to 1 inch, 2.28c, and 1½ inch and larger, 2.18c; smooth finished machinery steel, 2.18c; flat sleigh shoe, 1.83c; concave and convex sleigh shoe, 2.08c; cutter shoe, 2.36½c; toe calk steel, 2.33c; railway spring, 1.98c; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are without change at 50 per cent off in car lots, and 45 per cent in less than car lots in base territory.

Cast Iron Pipe.—The only contracts of moment closed in the past week are those of Elyria and Columbus, O., for 500 and 600 tons respectively. A large amount of small business for repairs and extensions

is constantly in evidence, but no tonnages of unusual proportions are pending. Prices are without change as follows: Four-inch water pipe, $38.60; 6 to 12 inch, inclusive, $37.60; 16 inch and upward, $36.60; gas pipe, $1 a ton higher.

Merchant Pipe and Boiler Tubes.—The new prices of the National Tube Co. have been well received by the trade. They are regarded as conservative in view of the enormous tonnage that has been taken for last half delivery since the company withdrew from the market. No improvement on the delivery problem has resulted from its temporary absence from the market. Consumers' quotations, carload lots, Chicago delivery, on the basis of the new freight rate, are given below. On steel pipe, jobbers are entitled to one point and five per cent additional:

MERCHANT PIPE.

	—Steel— Black.	Galv.
¼ to 6 inches, inclusive.....	71.2	61.2

BOILER TUBES.

	Steel.	SteelIron.
2¼ to 5 inches, inclusive.....	62.2	49.2

Wire Products.—The volume of business pouring in upon mills is without cessation. Not in several years has the pressure for deliveries been maintained for so long a period as has been the case in the last few months. It is impossible to cope with the current demand, and mills have adopted the only recourse of dividing their output, giving to each a portion of their specifications that the immediate wants of all might be relieved. No stocks have been accumulated, and it is expected the entire summer's output will be consumed in overtaking delinquent shipments. Prices are firm, but without change as follows:

Wire nails, $2.15; painted barb wire, $2.30; galvanized barb wire, $2.60; smooth annealed wire, $2.30; polished staples, $2.55. Carload lots to retailers, five cents higher; less than carload lots, 15 cents higher.

Coke.—Very little trading on foundry coke is under way in the local market. Offerings are plentiful and prices soft. We quote Connellsville 72-hour brands, $3 to $3.25 ovens.

Old Material. — The tendency towards higher levels is more accentuated in the local market. This is most strongly evidenced in cast scrap and melting steel. No 1 cast is firm at a minimum of $18.50 Chicago, and stove plate at $15. These materials reflect the increasing strength of pig iron and dealers are disposed to hold their stock in anticipation of realizing greater profits later. Nothing better than $16 has been offered for railroad malleable, but dealers decline to sell at this price in view of the shortage of the furnace product. Cast and mixed borings are also in active demand, and prices on same have advanced to a minimum of $10.50. Machine shop turnings have also been raised 50 cents a ton. The demand for steel scrap is largely from eastern mills, and these have paid $19 Chicago for old rail stock. Two new lists have been issued this week, one for 4,200 tons from the Burlington, and one of 2,100 tons from the Illinois Central. We have revised our prices, and quote gross tons in the first paragraph as follows:

Old Steel Rails (less than 3 ft.)	18.50 to 19.00
Old Car Wheels	25.00 to 25.25
Old Iron Rails	24.50 to 25.00
Rerolling Rails (3 feet and over)	19.00 to 19.50
Light Section Relayers, 45 lbs. and under, subject to inspection...	30.00 to 32.00
Relaying Rails, subject to inspection	28.00 to 30.00
Frogs, Switches and Guards.....	17.25 to 17.50
Heavy Melting Steel	15.75 to 16.25
Mixed Country Steel.....	12.50 to 13.00

We quote net tons as follows:

No. 1 R. R. Wrought.....	$15.75 to 16.00
No. 2 R. R. Wrought.....	14.75 to 15.00
Shafting	17.50 to 18.00
Dealers Forge No. 1.....	13.00 to 13.50
Pipes and Flues.....	12.00 to 12.50
No. 1 Cast, 150 lbs. and less...	18.50 to 19.00
No. 1 Mill.....	10.00 to 10.50
Mixed Busheling (No. 1 & No. 2)	11.50 to 12.00
Country Sheet	8.50 to 9.00
No. 1 Boiler Cut	11.50 to 12.00
Boiler Punchings	15.00 to 15.50
Cast Borings	10.50 to 11.00
Mixed Borings, etc.....	10.50 to 11.00
Machine Shop Turnings.....	12.50 to 12.75
Railroad Malleable	15.75 to 16.25
Agricultural Malleable	14.75 to 15.25
Stove Plate and Light Cast Scrap	15.00 to 15.50
Old Iron Splice Bars.....	18.50 to 19.00

CLEVELAND.

Heavy Ore Shipments.—Malleable Sold for Next Year's Delivery.

Office of THE IRON TRADE REVIEW,
Browning Building, May 22.

Iron Ore.—Shipments from the head of the lakes are being made at a lively rate, and the total up to date exceeds that of the same period last year. Arrivals at lower lake ports have consequently been numerous, as many as 13 boats in one day having arrived at Cleveland. There is a good demand for vessel tonnage, but most of the boats have all they can do to keep up on their contracts.

Pig Iron.—About 25,000 tons of malleable were sold last week for delivery during the first half of 1908 at $22 furnace. The sales of other grades have been small, mostly in lots of 100 to 300 tons of foundry iron, for delivery during the last half of the present year, on a basis of $24, Cleveland, for No. 2 foundry. A small tonnage of foreign iron has been sold at $26 delivered in Cleveland. The present market resembles that of the fall of 1902, when, in addition to the sales being made for prompt shipment, contracts for delivery as far ahead as December, 1903, were being made. There is, however, a disposition to be cautious about making contracts for next year's delivery. We quote, f. o. b. Cleveland for last half delivery, as follows:

Bessemer	$23.90
No. 1 Foundry	24.50
No. 2 Foundry	24.00
No. 3 Foundry	23.50
No. 2 Southern	24.35
Gray Forge	22.50

Coke.—The coke market continues weak. Low spot prices evidently have encouraged buyers to believe that lower quotations will prevail on contracts, and very little contracting is now being done. Spot furnace coke can be had at from $2 to $2.25, and for last half at $2.25 to $2.50. For last half delivery, quotations on foundry coke range from $3.15 to $3.35.

Finished Material.—The plate market continues very strong, and some contracts are now being made for delivery during the last half of the year at 1.90c, Pittsburg. Cleveland mills are selling at 2 cents. Contracts for steel bars are being made in increasing number for the year ending July 1, 1908. Buyers have ceased to hope for concessions and agricultural interests are pretty well covered. The bar iron market does not improve, and prices are irregular, but Cleveland mills are not uneasy as they are well supplied with orders.

Old Material.—There has been a slight improvement in the market which has expressed itself particularly in borings, turnings and busheling scrap. Borings especially are in good call and with turnings are somewhat of a scarce grade. Railroad wrought, which has been very weak, is a trifle stronger. The rest of the market remains firm. In general, conditions look stronger and there is a firmer undertone. We have revised our quotations and quote, f. o. b. Cleveland, gross tons, as follows:

Old iron rails	$24.00 to 25.00
Old steel rails (re-rolling)	17.50 to 18.50
Old steel rails (under 6 feet)	18.50 to 19.50
Old car wheels	23.50 to 24.50
Steel boiler plate	14.50 to 15.00
Steel axles	22.00 to 23.00
Malleable iron (railroad)	18.50 to 19.00
Malleable iron (agricultural)	17.00 to 17.50
Heavy steel	16.50 to 17.00
Country mixed steel	14.50 to 15.00
Low phosphorus	21.00 to 22.00

We quote net tons as follows:

No. 1 R. R. wrought	$16.50 to 17.00
No. 1 busheling	14.50 to 15.00
No. 1 machine cast	18.50 to 19.00
Iron axles	25.00 to 25.50
Axle turnings	13.50 to 14.50
Wrought turnings (free from cast)	12.50 to 13.00
Grate bars	14.50 to 15.50
Pipes and flues	14.00 to 15.00
Tank iron	12.50 to 13.50
Hoop and band iron	8.50 to 9.00
Sheet iron	7.50 to 8.50
Wrought drillings	12.50 to 13.50
Stove plate	14.50 to 15.50
Cast borings	10.75 to 11.25

CINCINNATI.

More Interest in Pig Iron for Next Year.—Active Business in Coke.

May 21.

Pig Iron.—The market has made but little change during the week. Spot iron is quiet and is obtainable at $21.50 Birmingham although some sales of iron on track have been made at $22 Birmingham. Northern furnaces are asking $25 at furnace for what little iron they have to offer. We quote spot iron delivered Cincinnati as follows:

Southern foundry No. 1	$25.25 to 25.75
Southern foundry No. 2	24.75 to 25.25
Southern foundry No. 3	24.25 to 24.75
Southern foundry No. 4	22.50 to 22.75
Southern No. 1 soft	25.25 to 25.75
Southern No. 2 soft	24.75 to 25.25
Southern gray forge	22.25 to 22.75
Northern No. 1 foundry	26.65 to 27.75
Northern No. 2 foundry	26.15 to 27.15
Northern No. 3 foundry	25.65 to 26.65

For third quarter the ruling quotation is $21 Birmingham with some furnaces asking $21.50. There is some northern iron for third quarter held at $25 at furnace.

For last quarter the market appears to be about $19.50 to $20 Birmingham for southern iron and $23 to $23.50 for northern.

These prices are for the higher grades. The lower grades are still subject to special negotiation and the usual price differences between the grades are disregarded.

There is more interest in iron for delivery over the first half of next year and southern iron has been quoted and sold at $18.25 to $18.50 Birmingham and northern iron is offered at $22 at furnace in southern Ohio, for the first quarter. It is probable that buyers are inclined to accept contracts running into the new year in order to get a better average price on their last quarter needs. There is nothing in the way of large tonnage sales and business is made up of moderate orders of from 100 to 500 tons. Importing firms report ample demand to take the arrivals of foreign iron readily. Furnace shipments from the south are good. We quote for last quarter delivery delivered Cincinnati as follows:

Southern Foundry No. 1	$23.25 to 23.75
Southern Foundry No. 2	22.75 to 23.25
Southern Foundry No. 3	22.25 to 22.75
Southern Foundry No. 4	21.75 to 22.25
Southern Foundry No. 1 soft	23.25 to 23.75
Southern Foundry No. 2 soft	22.75 to 23.25
Gray Forge	20.75 to 21.00
Northern foundry No. 1	24.65 to 25.15
Northern Foundry No. 2	24.15 to 24.65
Northern Foundry No. 3	23.65 to 24.15

Finished Material.—There has been a good retail demand with no change in quotations. Small orders are filled here at the following quotations:

Angles, 3 x 3 and over, 2.15c to 2.25c; beams and channels, 15 inches and under, 2.15c; small angles and architectural channels, 2.10c base; plates ¼ inch and heavier, 2.10c; 3-16 inch, 2.20c; No. 8, 2.20c; sheets (blue annealed) No. 10, 2.30c; No. 12, 2.35c; No 14, 2.40c; No. 16, 2.50c; box annealed sheets, Nos. 18 and 20, 2.65c; Nos. 22 and 24, 2.75c; Nos. 25 and 26, 2.80c; No. 27, 2.85c; and No. 28, 2.95c. Iron and steel bars, $2.00c base, boiler tubes, 60 per cent off base; turnbuckles, 45 per cent off; rivets, 3.15c base; cold rolled shafting, 45 per cent off list; steel tire, 2.10c base.

Coke.—There has been an active business in coke this week and while prices have been rather easy with sales in some instances below our quotations, but at the close there is a somewhat steadier feeling. The offerings of coke are heavy, however, and ovens appear eager for business at the present quotations. Some large contracts in foundry cokes have been closed. We quote prices in the leading coke producing districts as follows:

Wise County, Va., Furnace Coke, prompt shipment	$2.75 to 2.90 per ton
Wise County, Va., Foundry Coke	3.25 to 3.50 per ton
Pocahontas Furnace Coke, prompt shipment	2.60 to 2.75 per ton
Pocahontas Foundry Coke	3.10 to 3.40 per ton
Connellsville Furnace Coke, prompt shipment	2.75 to 2.90 per ton
Connellsville Foundry Coke	3.25 to 3.75 per ton
New River Foundry Coke, prompt shipment	3.25 to 3.50 per ton
New River Furnace Coke, contract	2.75 to 2.90 per ton

*Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices on the following basis: $1.60 to $1.65 per ton on $9.00 pig iron, plus 17 to 18 per cent of the advance on pig iron above $9.00 Birmingham.

Old Material.—The demand is only moderate and the market is quiet. The strength in the pig iron market is giving a steadier tone to the situation, but the offerings are still rather free. We quote:

Old No. 1 R. R. wrought net tons	$16.50 to 17.50
Cast machine and f'dy, net tons	18.50 to 19.50
Old iron rails, gross tons	24.50 to 25.50
Old steel rails, gross tons	17.50 to 18.50
Old short lengths, gross tons	19.00 to 20.00
Old iron axles, net tons	25.50 to 26.00
Heavy melting scrap, gross tons	20.00 to 21.00
Stove plate, net tons	14.50 to 15.50
Wrought turnings, net tons	13.00 to 13.50
Cast borings, net tons	11.00 to 11.50
Car wheels, gross tons	23.50 to 24.00

PHILADELPHIA

Heavy Importations Continue—Market Quiet and Prices Firm.

May 21.

Pig Iron.—Little change is to be noted from the conditions of a week ago. Such as there has been is in the direction of greater strength, and a greater disposition to take up business for 1908. Until within the last week one or two producers have been rather inclined to put off negotiations extending beyond the present quarter, but many inquiries are now being received and it is even reported that some sales for the first quarter have been made, though no figures are mentioned. A large business has been done for the last half and last quarter, and prices are gradually stiffening. It is only a few weeks since some large sales of basic were made for the last quarter on the basis of $23.00 a ton. Now it would be practically impossible to get any for less than $23.50, and $23.75 and $24.00 are being paid. Middlesboro is firm at $22.50 on dock, and Scotch at $24.50 to $25.00. Considerable purchases of English iron continue, and already five vessels with cargoes of over 20,000 tons are chartered for June delivery here. If the English stores, which are now being drawn up at the rate of 2,000 or 3,000 tons a day, hold out, heavy importations to this country are expected for the rest of the year. Prices, which are held very firmly, with a steady tendency toward the higher range, may be quoted for the last half as follows:

No. 1X Foundry	$25.00 to 25.50
No. 2X Foundry	24.25 to 24.75
No. 2 Plain	23.75 to 24.25
Standard Gray Forge	22.75 to 23.25
Basic	23.50 to 24.00
Low Phosphorus	27.00 to 27.50

New Material.—There is not the same snap in the demand for finished products that there is for pig iron, but orders continue to come in in fair volume, and the mills show no indications of any let-up. Prices show no change, as follows: Beams, channels and angles, according to specifications, 1.83½c to 2c; refined iron bars, 1.83½c to 1.88½c; steel bars, 1.83½c to 1.88½c; plates, 1.98½c to 2.03½c.

Old Material.—There is a better feeling in the scrap market, and prices in some lines have advanced on the improved demand. This is especially the case with steel scrap. Prices follow:

Old steel rails	$19.50 to 20.00
No. 1 steel scrap	19.00 to 19.50
Old steel axles	22.50 to 23.00
Old iron axles	31.00 to 32.00
Old iron rails	26.50 to 27.50
Old car wheels	23.00 to 24.00
Choice scrap R. R. No. 1 wrought	20.00 to 20.50
No. 1 yard scrap	18.50 to 19.00
Machinery Scrap	21.50 to 22.00
Low phosphorus scrap	23.50 to 24.00
Wrought iron pipe	16.00 to 17.00
No. 1 forge fire scrap	16.50 to 17.00
No. 2 forge fire scrap, ordinary	11.50 to 12.00
Wrought turnings	16.50 to 17.00
Axle turnings, heavy	17.00 to 17.50
Cast borings	16.25 to 16.75
Stove plates	17.50 to 18.00

NEW YORK.

Strike Delays Unloading of Iron.—Ocean Freights Advance.—Heavy Buying.

Office of THE IRON TRADE REVIEW,
Room 1005, No. 90 West St., May 21.

Pig Iron.—The continuation of the longshoremen's strike at New York has already worked considerable hardship to importers of British iron and threatens further trouble. In one in-

stance two considerable delays elapsed while a cargo was being unloaded, with the result that the metal was finally taken off by the deck hands of the vessel. The import movement, so far as new engagement of iron is concerned, is likely to be smaller from now on, partly because of the increasing difficulty of securing dock room for loading in the Middlesboro district and more particularly because of the advance in trans-Atlantic freight rates to seven shillings. In the case of New York, this advance, which amounts to about one shilling, is declared to be due to the strike of longshoremen, but other ports are affected as well by the new rate. At tidewater No. 3 Middlesboro is now selling at $22.50. The Buffalo district is taking a large tonnage.

In domestic irons the week has seen a continuation of the heavy buying movement inaugurated almost a month ago, all grades of iron being involved and the aggregate tonnage of sales being extremely large. The General Electric Co. is understood to have filled its requirements for which inquiries have been pending for some time. In all, its purchases in the last few weeks have totaled 20,000 tons. A considerable part of the last purchase went to one producer and the entire lot brought prices close to current quotations. The American Car & Foundry Co. is in the market for 3,000 tons and several other inquiries ranging down to 1,000 tons each are pending. Two large Buffalo consumers are about to enter the market. Third quarter basic sales are reported at $23.50, Pennsylvania furnaces. No. 2 X foundry is quotable at $25.00 to $25.50, furnace, for spot delivery and at $23.50 for the third quarter. The high level of prices is having the effect of frightening some prospective customers out of the market and the cases are becoming more frequent where the inquiry does not immediately develop into business or does not result in sales of the full tonnage on which figures are asked. However, a canvass made during the past week of a large number of machine tool manufacturers, all heavy melters of iron, failed to disclose a pessimist. All reported an abundance of orders, and while some expect a slight recession of business during the fall, none expects any decided lessening of business activities. We quote tidewater prices as follows, the higher figures being for spot shipment:

Northern Foundry No. 1	$24.00 to 26.00
No. 2X Foundry	23.50 to 26.00
No. 2 Plain	23.00 to 25.50
No. 2 Southern Foundry	23.50 to 26.00
Basic	23.00 to 24.50

Finished Materials.—The past week has not been prolific of new business in structural lines, the most important lettings being a bridge for the Atlantic Coast line, 1,400 tons, and a building for a Nevada mining plant, 1,400 tons, both going to the American Bridge Co. The Blackwell's island approach is still pending and the Lawyers' Title and the American News buildings in this city are shortly to be let. Steel bars are active with no shading in prices. No large cast iron pipe orders are coming out. Plates continue in good demand, with pipe interests about to enter the market for several lots of good size, including one of 5,000 tons. For immediate shipment there is evidence that consumers are willing to pay heavy premiums over the prevailing base price.

Old Materials.—Although prone to irregularity in several items, the market on the whole is one of considerable strength, in sympathy with pig iron conditions. Heavy steel is in keener demand with prices somewhat higher and the prediction is made that $20.00, delivered at mills, will be reached shortly. The supply is limited and only scattered lots are to be had. Cast borings, burnt iron and heavy cast scrap continue firm. Stocks are increasingly low and the current railway offerings are being readily absorbed. We quote New York delivery, gross tons, as follows:

Old iron rails	$24.50 to 25.50
Old steel rails, long lengths	18.00 to 18.50
Old steel rails, short pieces	16.25 to 16.75
Relaying rails	28.00 to 29.00
Old car wheels	24.00 to 24.50
Old iron car axles	28.50 to 29.50
Old steel car axles	21.00 to 21.50
Heavy melting steel scrap	17.50 to 18.00
No. 1 railroad wrought scrap	18.00 to 18.50
Iron track scrap	17.00 to 17.50
Wrought pipe	14.50 to 15.00
Cast borings	14.00 to 14.50
Wrought turnings	14.75 to 15.25
Heavy cast scrap	19.00 to 19.50
Railroad malleable	17.00 to 18.00
Agricultural malleable	15.00 to 16.00
Stove plate	15.50 to 16.00
Grate bars	14.50 to 15.00

BUFFALO.

Pig Iron Market Firm, But Buying is Not Very Active.

May 21.

Pig Iron.—The market holds up firm in this district and some selling has been in progress the past week, a trifle in excess of the week previous, but selling for the fourth quarter is by no means general, some of the furnaces having ceased quoting on last quarter iron. Some tonnage has been covered into the first quarter, but no quotations have been issued as yet on first quarter.

It appears that most of the consumers are protected for the first half and in a good many cases into the third quarter. Inquiries for prompt iron are not uncommon and advanced prices are being paid for what little prompt that is picked up here. The principal demand continues to be for No. 2 foundry, a large number of consumers having need of silicon from 2.25 and 2.75 per cent to cover their business the balance of the year.

All the furnaces in the Buffalo district are working at full capacity and are reported in good shape. They will be operated at their limit capacity for the balance of the season.

Nothing definite is given out here regarding the time when schedules of first quarter, 1908 prices will be issued, but owing to the strong market of the past few months and the fact that tonnage has been covered very closely for the remainder of 1907, it is generally believed that first quarter quotations will be forthcoming at an early date. We quote for last quarter delivery as follows:

No. 1X Foundry	$23.75 to 24.00
No. 2X Foundry	23.00 to 23.50
No. 3 Foundry	22.75 to 23.00
No. 2 Plain	22.50 to 23.00
Malleable Bessemer	23.00 to 23.50
Gray Forge	22.00 to 22.50
Charcoal	27.00 to 27.50

ST LOUIS.

Active Inquiry For Pig Iron and Prices Are Strong.

May 20.

Pig Iron.—Inquiries for pig iron are strong, covering requirements for the last quarter, and some for the first half of the next year. No. 2 spot or for immediate shipment is quoted at $24 f. o. b. Birmingham.

Our quotations for last quarter, Birmingham, to which the freight of $3.75 to St. Louis added, follows:

No. 1 Southern	$24.25 to 24.75
No. 2 Southern	23.75 to 24.25
No. 3 Southern	23.25 to 23.75
No. 4 Southern	22.75 to 23.25

Coke.—Inquiries are good for shipment for the balance of the year, and for contract for one year from July 1. Prices range from $3.25 to $3.75 on contract, and $3.50 to $3.75 for foundry for immediate shipment f. o. b. Connellsville. The freight to East St. Louis is $2.80, and to St. Louis, $2.90. Furnace coke is not so strong. Prices range from $2.25 to $2.60 for immediate shipment.

Steel.—The market is reported somewhat at a standstill. The American Bridge Co. has received an order for 500 tons of structural material for an overhead trolley to be constructed for the Memphis Warehouse Co., at Memphis, Tenn. The contractor is the Selden-Brack Construction Co., of St. Louis. Negotiations are on for the construction of the La Salle building at Broadway and Olive street, St. Louis,

but the contract for the steel work has not been let.

Scrap Iron.—The scrap iron market is holding its own, prices ranging as per last week, f. o. b. St. Louis, as follows:

	PER TON
Steel rails (less than 3 ft.)	$17.00
Car wheels	23.50
Iron rails	23.00
Rerolling rails	17.00
Heavy melting steel	17.00
Country steel	12.50
No. 1 railroad wrought	16.50
No. 2 railroad wrought	15.00
Shafting	17.00
Country wrought	12.00
Pipes and flues	11.50
Cast iron	17.00
No. 1 busheling	12.50
No. 2 busheling	11.50
Boiler sheet and rings	12.50
Cast iron borings	10.00
Turnings	12.00
Railroad malleable	14.50
Agricultural malleable	13.50
Store plate	13.00
Iron splice bars	17.50

BRITISH IRON MARKET.

Pig Advancing in Price.—Americans Buying for October Delivery.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., May 8.

Pig iron has been going forward by leaps and bounds during the past few days. Yesterday's quotations touched the high figure of £3 1s ($14.92), and the market realized a boom excitement. The advance for the week has been 3s in Cleveland iron and 2s 6d in hematite. The market is still establishing records. The April figures in regard to the stocks showed a removal of 56,994 tons, while the shipments for April were 177,627 tons. Both are much in advance of anything yet done. The month of May so far has shown an improvement even upon these figures, the withdrawal from stores averaging 3,000 tons per day during the past week Some of the American buyers are making arrangements for October deliveries. The amount now in store at Connal's is 384,817 tons. For a long time hematite has been practically stationary, but this was reduced on Saturday from 48,623 to 45,090 tons. There are a good many complaints in this district about inability to get hematite. Midland irons are not readily responsive to foreign buying, but the effect of the Cleveland advances was a rise of 1s to 1s 6d per ton on 'Change on Thursday last. Such standard brands as Northampton and Derbyshire are from 2s to 3s dearer than they were a fortnight ago. The cabled report in British papers from THE IRON TRADE REVIEW of the strength of the American demand had a considerable effect in stimulating the market. The formal announcement that the Verband has been renewed for another five years has also promoted the boom, while there is a probability of output being restricted, for several furnaces are about to be blown out for repairs. The market is still in a somewhat excited condition. Today's sales have reached 12,000 tons with prices varying from £3 8d ($14.84) to £3 1s ($14.92). Northamptonshire £2 18s 6d ($14.32) and Derbyshire £3 1s ($19.92).

BIRMINGHAM, ALA.

Sales of Pig Iron for Next Year's Delivery Continue.—Prices Are Firm.

May 20.

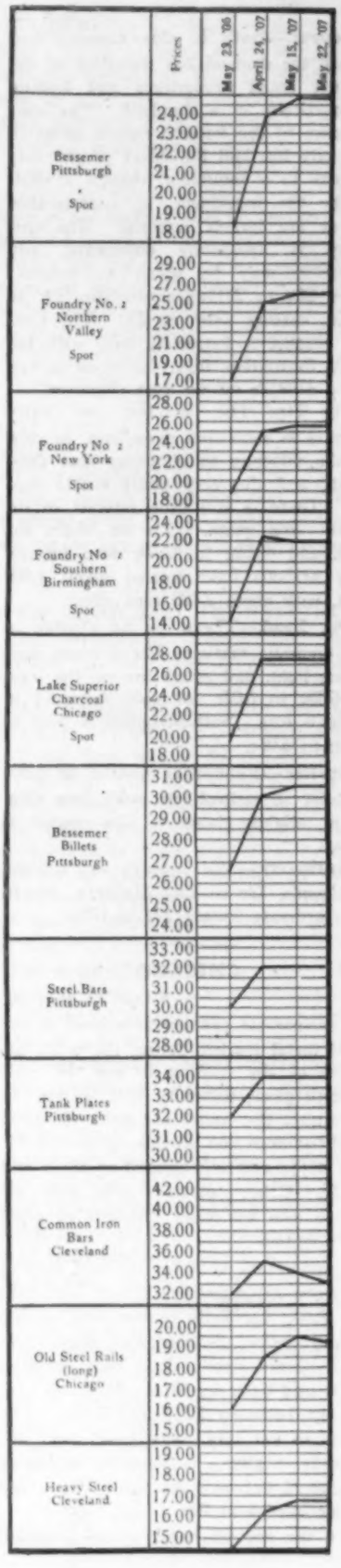
Iron for delivery during the first quarter in 1908 is selling right along in Alabama and if there is no hesitation in the demand, it is believed that the probable make for that period will be sold out before the end of the first half of this year. Third quarter iron of 1907 is considered almost the same as spot iron and commands a special price. Fourth quarter iron is not such an easy article either, regular customers, of course, being able to place orders, but at the high prices which prevail. All predictions as to the future made in this district are inclined towards a happy condition through the entire coming year. The consumers appear to have orders in hand that will require a large tonnage of iron to complete and some bids are being made on healthy contracts in the future. The cast iron manufacturers, who are among the largest interests among the consumers do not anticipate any falling off in business. The soil pipe makers and foundries are well supplied with business and in several instances are making enlargements of their plant.

Iron for delivery during the first three months of 1908 is from 25 to 50 cents under the quotations for the fourth quarter in this year.

The production in this district shows some improvement. The Tennessee Coal, Iron & Railroad Co., has three furnaces in blast at Bessemer, Ala. Some of the older furnaces in the district are doing better than usual. No pains are being spared to get the largest possible production. Much iron is being sent to the west. Transportation facilities are now first class and very little iron is remaining on the yards.

An order for another large engine to be shipped to Japan has been received by one of the local foundries and machine shops and will be pushed to completion.

PRICE CHART.



METAL MARKET.

NEW YORK.

May 22.

Copper.—Both in this country and abroad the demand has dwindled to extremely small proportions and trading is practically at a standstill. The continuance of the longshoremen's strike in this city has had the effect of reducing exports to a minimum, though at Baltimore the movement is considerable. Prices are largely nominal. The tendency is apparently downward, and quotations may be given as follows: Lake, 25c. to 25½c; electrolytic, 24c to 24½c; casting, 22½c to 23c. The London market is extremely dull, with but small fluctuation from the close of last week, £102 2s 6d for spot shipment.

Pig Tin.—The market for early delivery is somewhat more firm, in view of the difficulty in obtaining spot shipments and the very small visible supply. There is still little interest in futures. We quote 42.75c to 43.25c for spot, and 40.50c to 42.50c for futures. May arrivals have totaled about 1,500 tons, with about 2,400 tons afloat.

Pig Lead.—There is no change in the domestic market. The demand continues light, and prices are on the level of 6.00c to 6.05c for spot shipment in carload lots. Soft Missouri is held at 5.90c to 5.95c.

Spelter.—Refined is quoted at 6.40c to 6.45c in carload lots, with June shipment slightly lower. The market is easy.

Antimony.—We quote as follows Cookson's, 22c to 23c; Hallett's, 18c to 19c; ordinary brands, 17c to 17½c.

CHICAGO.

May 20.

Considerable excitement existed in the local metal market during the week because of the trading in pig tin. Although great difficulty still exists in obtaining the metal the price dropped slightly from last week's figures of 46c and 46½c and was quoted at 45½c and 45¾c. Other metals were not affected and no other changes in price were noted.

Copper lake sold for 26c and casting between 25½c and 26c. Sheet zinc sold for 8.60c La Salle in car lots of 100 pound casks. Spelter was quoted at 7¼c. Lead desilverized sold between 6.50c and 6.60c in 50 ton lots and corroding between 7.25c and 7.35c. The price in car lots was 2½c per 100 pounds higher. Cookson's antimony remained between 25c and 25½c and other grades at 24c.

In the second hand metal market wide variation was apparent in the prices quoted by different buyers. In some cases the variation was over 1½c. Buyers' prices quoted were:

Copper wire, 18.50c to 19.75c; heavy copper, 18c to 19.25c; copper bottoms, 17.25c to 18.50c; copper clips, 18c to 19.25c; red brass, heavy, 17.25c to 18.75c; yellow brass, heavy, 15.25c to 15.50c; red brass, borings, 15c to 16.50c; yellow brass, borings, 13c to 14.25c; light brass, 12c to 12.50c; zinc, 5c to 5.25c; pipe lead, 5.50c; tea lead, 5c to 5.25c; tin foil, 34c to 35c; pewter No. 1, 28c to 30c.

ST LOUIS.

May 20.

Lead and Zinc.—All of the mines in the Badger camp at Joplin, Mo., were inundated by floods last week, and many other mines in the district were put out of business in a similar manner, thus curtailing the output something like 1,500 tons.

Some of the smelters gave their purchasing agents a free hand to buy, fearing an advance in prices, and as a consequence there is little if any unsold ore in the district.

The output will be decreased about 500 tons per week, from the effects of the storm, but this may be lessened something like 150 tons by the starting of six new mills.

There was no further cut in the prices of zinc ore as the result of the storm damages, and a tendency of an upward turn was manifest Saturday night. The highest price paid was $50 a ton on a base of $45 to $47 a ton of 60 per cent zinc.

The highest price for lead remained at $82 per ton, with medium grades bringing $78 to $80.

MACHINERY CLUB OFFICERS.

(Special Telegram.)

New York, May 21.—The Machinery Club of the city of New York, which is to have quarters in the handsome terminal buildings now being constructed, has organized by electing Frank H. Stillman, president, R. C. Mickenny, vice president, Walter L. Pierce, treasurer and Theo. Walters, temporary secretary. James R. Vandyke is chairman of the membership committee and T. L. Motely, of the house committee. A governing committee of two has also been selected. The club has been incorporated, but will probably not secure temporary quarters, postponing its opening until the completion of the terminal building a year hence.

AMERICAN FOUNDRYMEN'S ASSOCIATION.

(Continued from page 803.)

The report of Dr. Moldenke showed a large increase in the membership of the American Foundrymen's Association, the enrollment having reached the total of 532. There were very few resignations during the year, and none of the members was dropped for the non-payment of dues. The balance in the treasury reached the total of $753.94, which was highly gratifying and augurs well for the future of the work. In commenting on the assistance rendered the members of this organization with advice on practical subjects, Dr. Moldenke said: "The secretary's office has been a bureau of information and has doubtless saved many dollars for the foundrymen who have taken advantage of its existence. Almost every week inquiries were received from those desirous of embarking in the manufacture of castings of all kinds and descriptions. It is a case of 'don't' most of the time, which advice, if followed, saves many heartaches for those who would have suffered from misdirected competition. No one can complain of legitimate competition when based on a thorough understanding of costs, but a plunge by one not conversant with the pitfalls of the foundry business often leaves a trail of ruin in the territory which he affects. The wonderful success of the exhibition of foundry machines and appliances at Cleveland has stimulated every foundryman to such an extent that I know of parties who now come here specifically for the purpose of purchasing equipment after a careful study of the various types displayed. In perhaps no industry are mechanical appliances needed more than in the foundry trade, and with the enterprise shown by our supply men in placing their best before us at one place and time, I venture to predict that this feature of our meetings will do more lasting good for the trade than anything else we can offer. I continue to urge foundrymen to join the association.

"The complaint is heard everywhere that there are too many organizations which the manufacturers are requested to join. This is true in a sense. So far as we are concerned, however, let the foundrymen secure memberships and delegate their foundry superintendents, foremen, patternshop foremen, metallurgists, and chief accountants to carefully follow the work that is being accomplished, and instead of an expense this expenditure will prove an investment."

Among the associations organized during the past year, to which Dr. Moldenke directed special attention, is the Association for the Promotion of Industrial Education, which he stated promises to aid in the solution of that vexed but all important problem of where and how to secure a supply of trade mechanics in the future. The government tests on coke for foundry purposes were also continued through the year, and he said that congress has appropriated additional funds, part of which will be used for the study of cupola practice. In view of the improved financial condition of the association, additional instruction papers will be published.

"Standard Methods for the Analysis of Cast Iron" were reported by H. E. Diller, of Chicago, and owing to the absence of M. W. Alexander, vice president of the American Society for Industrial Education, the "Supply of Skilled Labor for the Development of our American Industries" was discussed by Paul Kreuzpointner, Altoona, Pa., who outlined the work that is being carried on by the Pennsylvania railroad in the training of mechanics for its shops. Herbert E. Field, Pittsburg, presented a synopsis of his paper on "Manganese in Cast Iron." A report was also made by the committee appointed at the last convention to study the question, "Uniform Methods of Cost Finding." It recommended that the services of a specialist be secured to outline a practical cost system, which will embody the general principles applicable to the foundry business, with details merely suggestive, and subject to change and modification when applied to the plant of any member of the association. The committee was reappointed and was authorized to incur the expenditure suggested.

Tuesday Afternoon Session.

At the afternoon session, Tuesday, Henry B. Cutter, Seneca Falls, N. Y., presented a paper on "Cast Thread Fittings," in which he referred to the success that has been achieved in casting threads on fittings.

"The Evolution of the Foundry Business" was the topic of a paper read by Edward B. Gilmour, Elizabethtown, Pa. He described the gravity molding machines, made by the Mitchell-Parks Mfg. Co., St. Louis. Thomas D. West, Sharpsville, Pa., discussed "The Gray Iron Foundry as a Business Venture," and pointed out many of the disadvantages of this line of manufacture not apparent to those not fully conversant with foundry practice.

Dr. Richard Moldenke, Watchung, N. J., likewise directed attention to the advantages and disadvantages of the malleable foundry as a business venture, and suggested that no one should undertake to start in business without a daily output of from 3¼ to 5 tons. "Small Points in the Core Room Which Are not Considered" was the topic of the paper read by H. M. Lane, Cleveland.

The feature of the smoker at Lulu temple Tuesday evening was the presentation to Dr. Moldenke of a handsome silver loving cup, and $1,200 in newly coined gold pieces from the Philadelphia mint. The presentation was made by Herbert E. Field, Pittsburg, who in a few well-chosen words made the presentation on behalf of the foundrymen of America. The doctor was taken completely by surprise and was visibly affected.

The nominating committee appointed by President McFadden to select candidates for the various officials of the American Foundrymen's Association to serve during the coming year was announced before the close of the session Tuesday afternoon. It is composed as follows: J. S. Seaman, Pittsburg; A. Walker, Boston; George C. Davies, Philadelphia; L. L. Anthes, Toronto, Can., and Thos. Sheriffs, Milwaukee.

Foundry Supply Association.

The meeting of the Foundry Supply Association was held in the Second Regiment armory, Monday afternoon, for the purpose of discussing the financial affairs of the organization. While no definite report was presented, the indications are that a handsome balance will be carried over. A committee of five was appointed for the purpose of nominating officers and the final meeting will be held Friday, May 24. The committee consists of Thomas Malone, J. C. McCormick Co., Pittsburg; Henry E. Pridmore, Chicago; E. J. Woodison, Detroit Foundry Supply Co., Detroit, Mich.; R. B. Seidel, R. B. Seidel Co., Philadelphia, Pa.; C. S. MacNeal, Garden City Sand Co., Chicago.

Associated Foundry Foremen.

The fifth annual meeting of the Associated Foundry Foremen was held in the Manufacturers' Club on Monday evening. The attendance was large, and the enthusiasm manifested was indicative of the interest that is being shown by the foremen and superintendents in this organization.

The annual report of Secretary F. C. Everitt showed a net increase in membership of 36, making a total of 370. Despite the forward strides, the secretary stated that he regretted that more of the foundrymen and their foremen did not readily enter into this work and place their years of experience in the field, that their knowledge in general of foundry practice might be broadened to a greater extent and the foremen profit from a more complete course of study with the paramount idea of affording them an opportunity of educating themselves, not only from a practical, but a theoretical standpoint as well.

The method of electing officers aroused considerable discussion and it was the sense of the meeting that an opportunity be afforded each of the delegates to cast a ballot for any of the various aspirants instead of having that power delegated to the secretary. A committee of five was appointed to revise the constitution and by-laws, and was instructed to report at the next meeting. Officers for the ensuing year were elected as follows: James F. Webb, Elkhart, president; W. S. McQuillan, Warren, Pa., first vice president; W. O. Steele, Philadelphia, second vice-president. The presidents of the local organizations likewise act as vice presidents of the parent body.

NEW ENGLAND INDUSTRIES.

The Bridgeport Forge Co. has awarded contract for a new boiler house, 50 x 75.

The Auburn, R. I., plant of the Washburn Wire Co., Phillipsdale, R. I., has been sold to the General Fire Extinguisher Co., of Providence.

The Billings & Spencer Co., Hartford, manufacturer of drop forgings and machinists' tools, has let the contract for an additional factory for the small tool department. The building will be of brick, three stories, 50 x 115 feet.

The plant of the Omega Steel Co., Ansonia, Conn., which has been in the hands of a receiver for a couple of years will be sold at auction May 21. The company manufactured steel tools under a certain hardening patent.

Wells Bros. Co. is to build two additions to its plant this summer. Both will be of concrete and one story. The large one will be 100 feet square, as an addition to the machine shop; the other will be 40 x 80 and will enlarge the boiler and hardening room. This firm is located in Greenfield, Mass.

Two machinery concerns haxe filed certificates of incorporation. One of them is the Peix-McLachlan Co., of Danbury, capitalized at $10,000, which will manufacture machinery for making hats. The other is the Prentice Mfg. Co., of Middletown, capitalized at $25,000, which will manufacture various kinds of machinery.

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RUSSIA IN WORLD COMMERCE.

There are present indications that Russia, having overcome the acute form of unsettled labor conditions from which it suffered some months ago, will have to be reckoned with to a greater extent than heretofore as a contestant for the world market. Already the most important producer of manganese ore, of which it exports to America a very considerable tonnage each year, it is now taking advantage of the inadequate supply and correspondingly high prices of the lake ores to secure the introduction in this country of its standard ores. These are offered with an iron content of 65 per cent and higher and with phosphorus ranging about 0.025 per cent. As they are mined not far inland from the northern shore of the Black sea, the transportation problem is not so difficult as might be imagined and it is possible to make deliveries at furnaces in the eastern section of this country on practically the same price level as that of Lake Superior ore delivered. The extraordinary local demand for iron and the operation of all available plants have had the effect, of course, of maintaining at capacity the mining of ore at the usual domestic and foreign points of supply for eastern furnaces and have caused a resumption of activities at a number of mines long since abandoned, so that the importation of Russian ore is likely to prove of very moderate volume for some time, though promising eventually to develop into an extensive movement and perhaps to exert some influence in the establishment of domestic prices.

In launching its campaign for foreign markets, it appears that Russia has been largely influenced by the fact that, while industrial quiet has practically been restored in the iron and metal-working trades, the general conditions of the country are still unsettled to such an extent as to impair its consuming ability. A surplus exists and as foreign mills and factories are surfeited with orders for home consumption, the export field, thus neglected by Germany, England and United States, naturally appears to offer the best opportunities for its disposition. Only recently came the word that the Italian government had placed an order for a large tonnage of steel rails with the Donetz plant, which shortly before had taken a considerable rail order for shipment to Argentine Republic. Consular advices tell of negotiations now pending for the exportation of Russian sheet iron. German machine shops are turning out considerable quantities of factory equipment with which Russian capital is planning the manufacture of the simpler forms of hardware and other iron and steel products now purchased beyond the borders, and many other instances of an industrial awakening are to be found.

A factor, however, which will have wide effect for the present in keeping down the volume of export business from Russia, so far as finished forms are concerned, is found in the variance of the dimensions of its products from those manufactured abroad. While this is a difficulty which can be overcome, it has always proven an exceedingly slow process, and until it is overcome will constitute a serious barrier to the entrance of foreign markets.

WHEN THE LUMBER FAMINE COMES.

When Kipling was a newspaper correspondent, early in his career he once came to this country, crossed the continent from west to east and wrote of what he saw. One of the things which impressed him most strongly was the immense wealth of the country in natural resources, coupled with the recklessly wasteful manner in which this wealth was being used. That was twenty years ago, but all this time this waste has continued until today in several different directions we are tending toward the exhaustion of our inherent wealth. How disastrous has been the slaughter of the forests is evidenced by a recent publication of the agricultural department, from which the following startling facts are taken:

The consumption of lumber is increasing far more rapidly than population. In the decade ending with 1900 the increase in population was 52 per cent.; in lumber cut it was 94 per cent.

Our present annual consumption of wood in all forms is from three to four times as great as the annual increment of our forests.

The northeastern and lake states have long since passed their maximum production and the southern states are near that point; larger production can be looked for only from the Pacific states, and when they are stripped there will be no other virgin forest to turn to.

The annual per capita consumption of lumber in the United States is 400 board feet; in Europe the average is but 60 board feet.

The cause of the profligate waste of the past is found in the cupidity of private lumbering interests with eyes only for present profits and none for future welfare, but this is of little concern except as suggesting action for the preservation of the timber still standing. The more important fact is that the maximum yield of forest products has been reached, that the output is hereafter to decrease and that consumers of wood will shortly be driven by reason of its scarcity and increasing cost to find and adopt satisfactory substitutes. There is a growing sentiment for intelligent forestry, fostered particularly by certain leading universities, which will doubtless serve to prolong the approach of famine conditions, and extensive tree-planting by railway interests will lessen the perplexities of the cross-tie situation for a time, but none of these efforts is extensive

enough to promise any adequate measure of relief.

In the building operations of the future, concrete will play its important part, in all the more extensive undertakings in connection with the strength-giving steel bar. Tile and other clay products are to find more general use. The steel cross-tie, despite occasional set-backs, is well on its way to widespread adoption, and the wooden railway car will soon be a relic of an experimental past. Steel is already in wide favor for walls, as metal lath, and ceilings. Substitutes for wood are being found on every hand, for the most part in some form of steel which is commended by the increasing ease and cheapness by which it can be turned into any finished form desired.

ADVANCES DEMANDED

By the Amalgamated Association in Almost Every Kind of Work.

A review of the wage scale as adopted by the Toledo convention of the Amalgamated Association of Iron, Steel and Tin Workers shows that the sentiment of the delegates favors an advance in almost every department. It is some years since so general an increase has been asked, as the wage of every class of workmen in the mills is affected by the new scale and not on the downward trend.

Starting with the boiling department, where it was almost a certainty that an increase would be demanded, it is asked that henceforth the pay of the puddler increase on every one-twentieth of an advance per pound in the selling price of bar iron instead of on a one-tenth increase basis as in the past. To be specific, the demand is as follows: When the selling price of bar iron is one cent per pound, the pay for boiling shall be $5.00 per ton, and with every one-twentieth cent advance, there shall be a corresponding advance of 12 cents per ton to the puddler.

As readers of the THE IRON TRADE REVIEW are aware, under the old scale the allowance for boiling increased 25 cents per ton, but only after the selling price had reached one and three-tenths cents per pound.

During the time the selling price was advancing from one to one and three-tenths the wages of the puddler remained the same. This hiatus is removed in the new scale.

In the finishing scale an advance approximating seven and one-half per cent is asked. This will mean that if the conference sees the matter in the same light as the delegates, the roller will receive $1.11 3-10 per ton; the heater, 59 7-10 cents per ton, and the rougher and catcher 32½ cents per ton each with bar iron selling at one cent per pound as the base of the scale. With every one-twentieth advance in the selling price an increase of one per cent in wages is asked. This will affect all guide, ten-inch, hoop and cotton tie mills.

The sheet mill scale practically remains the same from a monetary standpoint, the important change being the placing of the day's hands on a tonnage basis. This practically wipes out the last vestige of per diem wage in the Amalgamated Association. That the rougher, catcher, pair heater, matcher and doubler be paid so much per ton instead of so much per day, is the proposition which the association will present to the wage conference.

In order to protect the men on the small or average mills, a foot note has been tacked on to this scale providing that where any mill averages less than 18 feet per square steel in two weeks an amount equivalent to ten per cent over the scale shall be paid.

The tin plate scale as adopted calls for an increase of 6 per cent for the roller; 6 per cent for the doubler; 16 per cent for the heater; 16 per cent for the catcher, and 9 per cent for the screw boy.

FATAL ACCIDENT AT ELIZA FURNACE.

(Special Telegram.)

Pittsburg, Pa., May 22.—An explosion at No. 1 Eliza furnace, Jones & Laughlin Steel Co., Tuesday evening, killed five men and injured four, some of whom will probably die. This follows the accident at No. 2, Jan. 9 last, which lost 12 lives. Last night's explosion was caused by a hang followed by a slip. The dust catcher broke out at the bottom, escaping gas forming a sheet of flames, which enveloped the men. The cause of accident must be investigated later. It would not be anticipated that enough pressure could be transmitted past the explosion doors and through the downcomer to break the dust catcher. Possibly it had been weakened by solid matter carried over.

Crude Steel Prices.—The Carnegie Steel Co. Monday announced the settlement price for June delivery of sheet bars on monthly adjustment contracts at $21. Third quarter price, to be announced June 20, will doubtless be this or higher. This price has been bid for deliveries late this year and refused by mills. Billets continue scarce, quotable about $30.50 Youngstown or $31.50 Pittsburg for Bessemer, and $33 to $34 Pittsburg for open-hearth, wire rods being at $37 to $39 Pittsburg.

AHEAD OF LAST YEAR

Are Shipments of Ore From Head of the Lakes—Heavy Snow.

Office of THE IRON TRADE REVIEW,
411 Providence Bldg.,
Duluth, Minn., May 18.

The movement of ore from the head of the lakes remains in much the same condition as last week except that there has been a general increase in the amount shipped. The corresponding week last year was an unusually poor one and this writing finds this year's shipments ahead of last. With the Hull-Rust and Morris mines shipping at a tremendous rate, the Missabe docks alone have handled over a million tons this season. Most of the other mines are still backward in their shipments though the weather has begun to break up during the week. As indicating the extreme condition existing here, may be cited the fact that the snow was heavy enough for skiing in Ely, Vermillion range, during the week. The cruisers going into Isle Royale to estimate the timber which the Steel Corporation is considering buying were held up until enough snowshoes for the party could be obtained from Duluth and all through the woods in the range country the snow on the north slopes is two and three feet deep. With these adverse conditions prevailing and the independent interests still having trouble with the boat situation, to have a greater output of ore already betokens the fulfilment of even the less conservative estimates for the year's production.

The figures for the week May 7 to 14 from the head of the lakes are as follows: Duluth, 422,381 tons in 1907 and 109,478 tons in 1906, Two Harbors, 252,853 tons in 1907 against 187,181 tons in 1906 and Superior 205,885 tons in 1907 as compared with 80,000 in 1906. As a result there was an aggregate shipment during the week this year of 881,119 tons against 376,659 tons last year and a total for the season of 1,910,764 tons against 1,903,216 a year ago. The gain has been increased in the past few days. A large number of independent interests ship from Allouez and there during the week a congested condition due to a shortage of boats has existed practically all week. The shortage capacity in yards and docks was taken up sufficiently to require a diminishing of output at a number of mines. The new transfer yards of the Great Northern are not yet completed, but will be a tremendous help when finished, as they are built on an adequate scale.

ARROGANT LABOR

CAUSING MUCH TROUBLE IN SAN FRANCISCO.

Sentiment in Favor of Settlement is Growing With Prospect That the Open Shop May Win in the Iron Trades.

(Special Correspondence.)

San Francisco, May 16.—The conditions of the iron and steel trades in San Francisco are in a muddle at present, and so are the conditions in many other industries. A long period of unprecedented prosperity, ample work for all hands, skilled and unskilled, at the highest rate of wages ever paid since the golden days of '49, when an ounce of gold was equal to a day's wage, had had a tendency to make mechanics, laborers and wage earners in almost all lines ask for raises, and they acquired the raising habit until the limit was reached, and the employers had to call a halt. Just now there are so many unions on strike throwing out vast numbers of wage earners, that the trouble must of necessity soon end.

The outlook for an early settlement of the differences between the employers and employes in the iron and steel trades of San Francisco is particularly promising just at present. And it is safe to predict that the strikers will be glad to return to work since other events entirely overshadow the strikes in the iron trades, and the workers in that line are ignored, forgotten and overlooked by wage earners who have enough to contribute for others who are out on strike.

Almost ever since the great fire of one year ago and until May 1 of this year, the day of the strike, the work of restoration and reconstruction had been prosecuted upon a vast scale, and employment was abundant for every workman in the city and the strangers as soon as they set foot within this place.

Measured by past experiences in which San Francisco abounds, it is safe to predict the outcome of the present controversy. After a short period of enforced idleness 90 per cent, at a conservative estimate, of the workmen in the iron and steel trades will realize that the present situation has been forced upon them by the turbulent element of the trades and the few but loud malcontents usually found in all organizations. There is already a strong current of sentiment manifest among the men towards assuming a more reasonable basis from which to consider the situation and to repudiate the action precipitated by the men of less skill but of more breath in the iron and steel trades.

A spirit of conciliation has become evident since the past few days among the employers and employed, which may result in an early settlement of the differences. It is quite probable that the whole question, including other trades and callings, will be submitted to arbitration at an early date, and the ultimate result may be an open shop.

It may be interesting to employers and workers in other parts of the country to learn the daily wage rate paid in San Francisco, of which the following are fair examples, neither the exceptionally high nor the very lowest, the latter being quite rare since rebuilding has begun: Boiler makers, $4.50; molders, $4; pattern makers, $5 to $5.50; machinists $3.50 to $4; blacksmiths, $4; coppersmiths, $3.50 to $4; pipe fitters, $4; sheet metal workers, $4; ship fitters, $4; iron fitters, $3.50 to $4; structural iron workers, $5 to $6.

The above figures represent the minimum wage scale in the different lines. Skilled mechanics receive much more than the minimum scale, and employers offer premiums to good workmen, who not only have the choice of shops, but they also choose their particular work. For overtime they receive extra pay, and there is an abundance of work. It is no exaggeration to say that the men who work easily earn 50 per cent more than the minimum wage scale.

To fully appreciate the present conditions in San Francisco it is necessary to know that since the disaster of last year, the greater part of the time and effort has been consumed in removing debris, clearing the ground, repairing and constructing foundations, and in hurrying temporary structures. That period having passed, actual construction of substantial buildings was commenced only a few months ago, and the demand for structural iron has been growing since.

From Another Correspondent.

San Francisco, May 16.—At this writing there are something less than 15 machine shops and foundries, carrying on business, that number having conceded the eight-hour day. The latest recruits to the number of shops shut down, which now number about thirty, are the Fulton Iron Works and the Golden State and Miners' Iron Works. Both of these shops had already conceded the demands of their employees, but have found since the first of May that they could not operate to advantage on account of the unsettled conditions outside of their own shops. The Union Iron Works and Risdon Iron Works closed on the first demand and will not resume work until the question of open shop is thoroughly worked out and they are permitted to employ whom they please.

In the main, the question here seems to be not that of wages, but of recognition of unionism and an eight-hour day. Our manufacturers contend that if they establish an eight-hour day it will ruin their business, because then they will be unable to compete with eastern shops who get ten hours work at less rate than is paid here. From every point it looks like a fight to the finish, and, while the temporary suspension of work in these lines is paralyzing business, it is going to be, in the long run, the best possible thing for this city.

With our telephone and street car systems practically tied up, we are surely in a bad way, but we can truthfully say that things were worse immediately after the fire, and we pulled out. With Mr. Calhoun, president of the United Railroads Co., making the fight that he is against organized labor, other employers are gaining courage and your correspondent believes if the governor of this state would call out sufficient military protection, most of our shops would resume work on an open shop basis, and while there might be some trouble for a limited period, the open shop would eventually win. So far as the iron trade goes, we are effectually "closed up" and intend to remain that way until a fair adjustment can be reached.

Strike Nears End.

The shipbuilders' strike, which has been in progress on the great lakes for the past several months, seems to be nearing an end. The men at the Ecorse and St. Clair yards of the Great Lakes Engineering Works voted to return to work and did so on May 20. At the same time the striking riveters at the Lorain plant of the American Shipbuilding Co. resumed work under the old conditions. The leaders have declined to put up more funds to carry on the strike, and the end of the trouble seems close at hand.

Prohibits Picketing.

Judge A. L. Sanborn, of the United States district court, Milwaukee, has handed down a decision in the molders' strike case of the Allis-Chalmers Co., which prohibits picketing of all kinds and also restrains strikers from visiting the homes of the employes to induce them to quit work. The decision is said to be one of the most sweeping on the subject of picketing ever made in this country.

Celebrate Anniversary. — The twenty-fifth anniversary of the opening of the South Chicago mills of the Illinois Steel Co. was celebrated last week by 250 steel rollers at the Calumet theater. The guest of honor was Richard Brunt who started the machinery which on May 15, 1882, rolled the first steel rail in the mills.

IN ONE BODY.

International Railway and Master Boiler Makers' Associations are Combined.

With the calling to order of the joint conventions of the International Railway and Master Steam Boiler Makers' Associations at the Hollenden hotel, Cleveland, May 21, by President C. L. Hempel of the former association, the consolidation of the two organizations into one body was practically effected. There were no formal ceremonies attending the launching of the combined association except when President J. H. Smyth, of the Master Boiler Makers, in the midst of his annual address paused a moment and extended his hand to President Hempel as an action symbolic of the united association. The attendance was very large and there were many visiting ladies in the audience for whom special entertainment had been provided by the local committee in charge.

After the preliminary exercises of invocation by Rev. Chas. B. Mitchell, the address of welcome by H. R. Cooley, member of the board of public service, for the city of Cleveland, and response by President Smyth, an address was delivered by J. F. Deems, president of the American Association of Railway Master Mechanics and superintendent of motive power of the New York Central lines. Mr. Deems made a plea for the kindly treatment of subordinates and emphasized the importance of properly training the young men as fit successors to those now in charge of the boiler-making industry of the country. He was followed by Secretary Harry D. Vought, of the New York Railroad club, who discussed the subject "Organization." "Real organization means get together, stick together, work together and stay together and to that end it is necessary to work for one another," said Mr. Vought. He laid stress upon the necessity of prudent management, the careful selection of officers and the exclusion of personal ambition as contributing forces to the success and strength of an organization.

President Smyth in his address dwelt upon the importance to human happiness and safety of the boiler-making industry and the attending responsibilites of manufacturers in this line. In suggesting matters for the attention of the convention he spoke of the reported dissatisfaction of Secretary Strauss of the department of commerce and labor with the present method of boiler inspection. President Smyth suggested that the association appoint a committee to use its influence with the proper authorities and also that each member consult with the congressman of his district in an effort to have the inspectors of boilers chosen from the trade instead of from the ranks of men without practical experience. President Hempel declared he believed the boiler makers were entitled to the first place of importance in the industry of the country in consideration of their contributions toward aiding commerce and human convenience and safety. Tuesday afternoon those in attendance at the convention were taken by special cars to Collinwood where the afternoon was spent in visiting the L. S. & M. S. railway shops. Wednesday's deliberations were given over almost entirely to the reading and discussion of papers dealing with practical subjects surrounding the boiler-making industry.

CHICAGO INQUIRY FOR FOREIGN IRON

(Special Telegram.)

New York, May 22.—A heavy tonnage of rails is under negotiation, but sales announced are few. The pig iron market is firm, but less active. Cleveland warrants declined about two shillings in the week. Chicago is inquiring for 8,000 tons Middlesboro. Basic movement is about over for the present.

OHIO ENGINEERS MEET.

The spring meeting of the Ohio Society of Mechanical, Electrical and Steam Engineers was held at Dayton, O., May 17 and 18 at the Hotel Algonquin. Two professional sessions were held, at the first of which the following papers were read and discussed: "Thermometric and Temperature Regulations," by H. Y. Norwood; "Some Experiments with Gasoline," by E. W. Roberts; "Steam Power vs. Gas Power," by F. W. Ballard, this latter paper being discussed by J. R. Bibbins, L. C. Finlay, E. L. Fagnan and G. G. Bennett. The second session, Saturday morning, was devoted to business and to the reading and discussion of two papers, "Recent Developments and Further Application of Centrifugal Pumps," by D. S. Brown and "Purification of Water for Boilers and Laundries," by C. E. Sutton.

Two excursions were held, one to the plant of the National Cash Register Co. on Friday afternoon and another to the National Military Home on Saturday afternoon.

DEFENSE FUND

Urged by President Van Cleave at National Association of Manufacturers' Convention.

"We want to federate the manufacturers of this country to effectively fight industrial oppression," said President James W. Van Cleave, president of the National Association of Manufacturers in his annual address to the members at the twelfth annual convention held at the Waldorf-Astoria, New York, May 20, 21, and 22. "The president ought to have nearly $500,000 a year for the next three years," he continued. "We should certainly provide ways and means to properly finance the association to confederate the employers of the country and to educate our manufacturers to a proper sense of their own duty, patriotism and self-interests."

Following President Van Cleave's address, a committee of thirty-five was appointed to devise means to raise the fund stipulated by him. About 400 members were represented at the convention, either in person or by proxy.

The association adopted the report submitted by the committee on interstate commerce, opposing any compulsory reduction in the rates of transportation of passengers by railroads. The committee in its report expressed the opinion that any such reduction would be accompanied by an increase in freight rates. A bronze tablet bearing resolutions expressive of the association's appreciation of the services of David M. Parry, of Indianapolis, formerly president of the organization, was unveiled and presented to Mr. Parry. F. H. Stillman, of New York, treasurer, in his report showed a working balance of $51,630, of which $24,713.01 was cash in the banks. The program of the convention included addresses at the business meetings by Charles A. Prouty, of the Interstate Commerce Commission; Francis B. Loomis, formerly assistant secretary of state; Charles M. Pepper, of the Department of Commerce and Labor; Dr. Charles P. Neill, commissioner of labor; Arthur D. Dean, and Capt. Henry A. Castle, of the post-office department. At the banquet the toasts included those by Secretary Straus, of the Department of Commerce and Labor, and others.

The Victoria furnace of the Goshen Iron Co. at Goshen, Va., was blown in on May 13. The furnace will run on foundry iron, making about 150 tons per day. The iron will be known as "Victoria." Rogers, Brown & Co. are exclusive sales agents.

DEATH OF ORRIN WOODWARD POTTER.

Orrin Woodward Potter, a pioneer in the steel industry of Chicago, and under whose direction the first Bessemer steel rail in America was rolled, died at Chicago, May 17. He was over 70 years of age. Mr. Potter was born in Rochester, N. Y., Dec. 15, 1836, and was educated in the public schools. At 15 he took up surveying and after four years of that work, he went to Detroit where he became identified with the iron business entering the employ of Capt. Eber B. Ward, owner of a rolling mill at Wyandotte, Mich. He later occupied the position of paymaster and chief bookkeeper in the rolling mill which Capt. Ward established in Chicago. The business grew rapidly and in 1864 the plant was organized into the Chicago Rolling Mills Co. with a capital stock of $500,000, the largest industrial concern in the west at that time. Mr. Potter was appointed its secretary and general manager. The venture proved successful under his management and five years later the North Chicago Rolling Mills Co. was organized with capital of $1,000,000. It took over the other plants and in 1870 added blast furnaces. In 1871 Mr. Potter was elected president and a Bessemer steel plant was erected in which was rolled the first steel rail in America. In 1880 a new plant at South Chicago was established and from an original investment of $250,000 with 250 employes it grew in four years to employ 6,000 men with a monthly pay roll of $250,000. In 1899 when the Joliet Steel Co. and other companies were merged into the Illinois Steel Co., Mr. Potter was chosen chairman of the board of directors. When the company was absorbed by the Federal Steel Co. and later in 1900 was merged into the United States Steel Corporation, he retired from active business. Besides his interests in the steel companies he was the principal owner of the Inter Ocean Transportation Co., an ore carrying enterprise on the lakes, and was the largest stockholder in the Metropolitan Iron & Land Co. which owns the Norrie mine in the Gogebic range.

OBITUARIES.

Charles H. Haswell, dean of the engineering profession, died May 12 at his home in New York as a result of a fall. Mr. Haswell was born on May 22, 1809, and was, therefore, almost 98 years old. In 1836 he became a United States navy engineer and rose to the position of engineer-in-chief, being the first man to hold that office. During his service with the navy, he designed all the machinery for ten warships. Upon his retirement from the navy, he became surveyor of steamships for the marine underwriters in New York, and followed this work for over 40 years. He also designed and located the buildings on Hoffman island and built the crib bulkhead at Hart's island in New York. At the time of his death he was still engaged in active practice, holding the position of consulting engineer to the Board of Apportionment of New York city. In addition to being an engineer, he was an author of note, having written "Haswell's Engineers' Pocketbook," of which 146,000 have been sold and "Reminiscences of an Octogenarian," which is a book of memoirs relating to New York from 1816 to 1860.

William H. Derbyshire, organizer and president of the Chambersburg Engineering Co., Chambersburg, Pa., and an authority on smith shop and boiler shop equipment, died recently, at the age of 58. He was born in Canton, Ill., March, 1859, and graduated from the Polytechnic College of Pennsylvania in June, 1877. He first secured employment with the John Roach & Son Ship Building & Engine Works, Chester, Pa., with which he remained until 1879, when he became associated with Frederick B. Miles at the Machine Tool Works. When the Machine Tool Works and Wm. B. Bement & Son were consolidated as the firm of Bement, Miles & Co., Mr. Derbyshire became general superintendent and remained with the plant until 1897, when he formed the Chambersburg Engineering Co.

Joseph W. Lowry, aged 41, president of the Duquesne Mfg. Co., Pittsburg, manufacturer of heaters and filters, and purchasing agent of the Westinghouse Air Brake Co., died recently at his home in Pittsburg, after a five months' illness with heart trouble.

Walter H. Bryant, formerly secretary of the Latrobe Steel Co., died May 3 at his home in Philadelphia, aged 58. Mr. Bryant retired from active business life about two years ago, but retained a large interest in the company with whose fortunes he had long been identified. He had been in poor health for several years.

William McShane, formerly manager of one of the plants of the McShane Bell Foundry Co., Baltimore, died suddenly in New York, May 6. In recent years Mr. McShane had been engaged in business in New York.

PERSONAL.

William T. Dunning has been elected director and secretary of the Chester Steel Castings Co., Philadelphia.

J. H. Hamilton has resigned as St. Louis representative of the Pittsburg Steel Co., effective July 1, and he will be succeeded by H. L. Price, sales agent, at Memphis.

J. S. Watson, manager of the Link-Belt Co.'s silent chain department, is now in Europe. While abroad Mr. Watson will visit the plant of Hans Renold at Manchester, England.

J. V. L. Wilson, formerly division superintendent of the American Sheet & Tin Plate Co., with headquarters at the Etna-Standard plant is now with the Colonial Steel Co., of Pittsburg.

Morton E. Farr has been elected president of the Detroit Shipbuilding Co., Detroit, to succeed the late William C. McMillan. Mr. Farr also retains the position of treasurer. Philip H. McMillan has been elected vice president and director.

Frank Noake of Wolverhampton, England, who may be remembered as being with the Iron and Steel Institute on its American trip, left the Mond Gas Co. some time ago, and has been supervising improvements and extensions at a bolt and nut works at Darlaston, England.

John H. Converse, president of the Baldwin Locomotive Works, has made provision for a building in Philadelphia, to be equipped at his expense, for the use of students of Princeton theological seminary, of which he is a trustee.

Henry Bromley, general ore and coal agent of the Lake Shore, will hereafter have charge of the coal, coke and ore traffic of the New York Central lines with the title of general coal and ore agent, according to announcement just made. His office will remain in Cleveland.

T. W. Harvey Jr., formerly president and general manager of the Belle City Malleable Iron Co., Racine, Wis., has organized the Harvey Steel & Iron Co., with headquarters at 1300 Old Colony Bldg., Chicago. Mr. Harvey will conduct a brokerage and jobbing iron and steel business.

L. I. Bregman, of the firm of L. I. Bregman & Co., dealers in old material, has removed from Cleveland to Chicago, where he is now permanently located in charge of the main offices of the firm at 534 First National Bank building. The branch office of the company remains in Cleveland at 933 Garfield building in charge of J. D. Frisbie.

THE IRON AND STEEL INSTITUTE

HOLDS ITS ANNUAL MEETING IN LONDON.

Sir Hugh Bell's Address on the Development of the Iron Trade.—Electricity in Steel Works Discussed.—Producer Gas Practice.—The Ageing of Steel.—Other Papers.

Office of THE IRON TRADE REVIEW.
Prince's Chambers, Corporation St.
Birmingham, Eng., May 11.

The spring conference of the Iron and Steel Institute met at the Institute of Civil Engineers, Victoria street, Westminster, London, on Thursday, May 9, under the presidency of Sir Hugh Bell, Bart. The meeting took place under exceptionally cheerful circumstances in view of the extraordinary activity in all branches of the iron and steel trade, to which several references were made in the course of the proceedings, and which fully accounted for the optimistic tone which prevailed at the opening session.

There was an exceptionally large attendance totaling from 200 to 300 members. The preliminary proceedings were presided over by Sir James Kitson, a past president, who had at his left hand Sir Hugh Bell, president-elect, and the support of the venerable Windsor Richards, and on his right hand, Bennett H. Brough, secretary, W. H. Bleckley, treasurer, and other prominent members. The other members present included Sir J. G. N. Alleyne, Bart., vice president; J. M. Gledhill, member of council; A. Lamberton, member of council; Sir W. T. Lewis, Bart., vice president; E. P. Martin, past president; Prof. A. McWilliam, Ebenezer Parkes, M. P.; J. Riley, vice president; Prof. T. Turner, T. Twyman, Kurt Kerlan, E. Trubshaw, T. Williams, M. Cooper, R. C. Whitfield, J. West Garth, J. M. While, F. C. D. Acland, A. J. Capron, H. G. Turner, S. E. Howell.

Sir James Kitson, opening the proceedings, read a letter from R. A. Hadfield, retiring president, now in New York.

James Kitson explained that Mr. Hadfield went over to New York to represent the Iron and Steel Institute at the special invitation of Mr. Carnegie at the dedication of the Engineering Societies' Building.

The secretary read the report of the council which stated that the year had been one of exceptional activity and progress. During the year the distinguished Austrian metallurgist Prof. Josef von Ehrenwerth, Leoben, was elected an honorary member, and 113 names had been added to the register, the present membership being 2,052. The report gave a long list of recipients of honors which included that of Andrew Carnegie, who had received the honorary degree of Doctor of Laws from the McGill University, and from the University of Pennsylvania; several honors to Sir Hugh Bell, Dr. James Douglas, elected an honorary member of American Institute of Mining Engineers; James Gayley, honorary Doctor of Science, at the University of Pennsylvania; Dr. R. W. Raymond, honorary Doctor of Laws, Lehigh University; J. Stead, member of council, elected an honorary

J. A. BRINELL,
Bessemer Medallist.

member of the American Institute of Mining Engineers.

Regret was expressed at the death of 41 members of the institute, amongst whom were several active contributors to its work, including Sir Charles Lowthian Bell, Sir David Dale, the latter of whom rendered exceptional services to the institute. A tribute to the work of J. T. Smith, J. G. Snelus, J. D. Ellis, F. W. Webb and Prof. Ledebur, was included in the obituary. The receipts for the year amounted to £6,610 and expenditures to £5,915 which included the final installment of £1,000 to the National Physical Laboratory. With reference to the joint meetings held a year ago, an ample guarantee fund was subscribed for the reception of the American visitors, of which only one-third was called up. The unexpended portion of this, amounting to £273 was generously presented by the subscribers to the institute fund; ten papers contributed to the American Institute of Mining Engineers were in accordance with the friendly arrangement between the councils of the two societies, published in the *Journal* of the Iron and Steel Institute; the papers contributed the Iron and Steel Institute being published in *Bulletin* of the American Institute of Mining Engineers. Vacancies on the council occurring during the year had been filled by the election and C. P. Schneider, of Le Cruesot, Heulett Wigan, W. H. Ellis, Sheffield, C. J. Bagley, Stockton on Tees, and A. Tannett-Walker, and Arthur Cooper had been elected vice presidents.

W. H. Bleckly, the treasurer, made a statement of income and expenditure, which showed that the revenue was the highest since the formation of the Institute in 1869, and that the expenditure was higher by £658 than that of 1905. There was still a considerable surplus due to the special guarantee fund, subscribed for the entertainment of the American guests. The receipts from the Carnegie scholarships, resulted in a deficit of £247 absorbing the balance left on the previous year.

The chairman briefly acknowledged the compliment, and humorously remarked that he had passed from the period of activity to the period of contemplation. Mr. Hadfield had maintained the institute at as high a point as it had ever reached. In years gone by, their great Nestor, Sir Lowthian Bell devoted himself very earnestly to the advancing of that institution. They were indebted to Mr. Hadfield for their brilliant reception at Sheffield, and for the way in which the American visit was made such a success. They were not going to place Sir Hugh Bell in the chair merely because he was the son of his father. But Sir Hugh had been elected because of his ability and capacity, and he had very gerat interests in the iron and steel trade of the north of England, while he was also a man of great scientific and literary attainments. Sir Hugh was ready to place those great gifts at the service of the community. He had great satisfaction in asking Sir Hugh Bell to take the chair and in assuring him of the loyal support of the members. He trusted that like himself Sir Hugh would treasure the memory of his presidency to the end of his existence. (Applause).

Sir Hugh Bell then took the chair and was very heartily greeted by the meeting. He rather received those

friendly expressions as a tribute to his father than to himself, and he thanked them for their kind reception. The newly-elected president next bestowed upon J. A. Brinell the Bessemer medal.

Sir Hugh in making the presentation said it was hardly necessary to do more than mention Mr. Brinell's name. If they asked what country they owed most to in the early development of metallurgy, the answer must be Sweden, and it was a peculiar pleasure therefore to enroll another Swede on the list of their Bessemer medallists. They took that opportunity to acknowledge the great courtesy they had received at the hand of His Majesty the King of Sweden.

Mr. Brinell acknowledged the gift in a neat little speech, evidently carefully prepared and in perfect English, though spoken with a slightly foreign accent. He regarded the honor, he said, as the highest a metallurgist could attain, and as a strong incentive to further work.

The president then proceeded to read his address, on "The Development of the Iron Trade; Its Relation to History and Science," an abstract of which follows. It was listened to with the closest attention; its somewhat discursive survey of the scientific progress made during the past century was much enjoyed, and there was a little peal of laughter over his prophetic account of the wonders which are to mark the achievements of the twenty-first century. The president also struck a chord of sympathy in his congratulation on the extraordinary demand now existing throughout the world for manufactured iron and steel. Sir Hugh introduced a special appeal to the members to assist in the completion and development of the chronological table which formed the appendix to the address, and which he said would be of great value to their successors 100 years hence.

President's Address.

The eighteenth century closed on a world under arms. The titanic struggle which we identify with the name of Napoleon was at its height, and the new century opened amidst the din of battle. But in October, 1805, Trafalgar Bay witnessed a sight which virtually ended the conflict, though nearly ten years elapsed before the war of the giants ended and Europe was left free to effect the great commercial development which, in one of its aspects, I propose to lay before you. For while Europe was one vast battle-field, and men's energies were being devoted to arms and their capital to armaments, the fertile brains of inventors were busy. Great discoveries were being made, or what is more important for our purpose, were being turned to useful ends.

Two centuries earlier men had become aware that a great instrument stood ready for those who knew how to use it, but the common opinion which gives to James Watt the credit of the steam-engine, and forgets Giovanni Branca, Solomon de Caus, the Marquis of Worcester, Denis Papin, and even Thomas Savery is doing that rough substantial justice which the popular view rarely fails to distribute. Though the great Scotchman was unquestionably aware of the importance of his improvements, which, in fact, made steam the powerful agent we know, even he would be surprised could he see how far his successors have surpassed him in its economical use, and what purposes they have made it serve. For Watt died in 1819, when the steamboat was in its earliest infancy and steam traction on land was hardly begun.

The propulsion of ships by steam dates from the end of the eighteenth century, but John Fitch's invention brought him nothing but misery, and led to his suicide in 1798. I will not seek to award the merit of the practical employment of steam in ships as between Henry Bell and Robert Fulton. The two purposes to which I have referred give us the reason why the nineteenth century should have witnessed the great industrial developments, to a rapid sketch of which my address is devoted.

While men were dependent on such puny instruments as those which had served their purposes since civilization dawned on the world, we may rather be surprised at the wonderful ingenuity which enabled them to accomplish so much than at the slow progress which had been made.

Now, of all the aids we have at our disposal today, none is more important than the facility of transport. It has been said that no real improvement in this respect was made from the time when the Romans began to build roads till steam took the place of vital power as a propelling force, and that the Emperors Caracalla and Geta, hurrying from York to claim the imperial purple in the third century, were no longer in reaching Rome than was Sir Robert Peel in returning from Rome to London to become the prime minister of Great Britain in the nineteenth. Yet till the power of bringing together in great masses the mineral resources of the world was attained, the output of iron was limited to those districts where the ore and the fuel chanced to lie in juxtaposition. The great developments of recent times depend entirely on the improvements in transport. What would the founder of the iron works at Dowlais have said had he been told that their prosperity would come to depend not so much on the fact that the iron ore and the coal could be extracted from the same pit as on the accessibility of Cardiff to the Basque Provinces of Spain? And the two things react on one another—without steam transport a highly developed iron trade is impossible; without abundant and cheap iron steam traction is inconceivable. It is for these reasons that the history of railways is so intimately connected with that of the iron trade.

As is well known the idea of a fixed and rigid path along which the wheels of a wagon should travel is a very old one, but until the end of the eighteenth century it had been little utilized. It remained for George Stephenson to show that it was essential to the construction of a road on which the means of traction should be that new power which the genius of Watt and his collaborators had placed at man's disposal. Here, again, the common opinion which connects the name of Stephenson with this great invention and disregards, or at least places in subordinate positions, Murdock, or Trevithick, or Blenkinsopp, or Hedley, does no more than substantial justice. The first quarter of the nineteenth century witnessed the trials and failures which were to end in revolutionizing carriage by land. In 1822 the first railway, in the modern sense of the word, was opened for mineral traffic, while three years later (in September, 1825), the first passenger line, began operations between Darlington and Stockton.

But to render this possible much more was needed than to invent the locomotive engine or the fixed path. Here, again, we find many names claiming to be inscribed on the roll of fame as entitled to the honor of inventor of the process which was destined to bear its part in the coming revolution. To Henry Cort we must, in any case, assign a prominent place on the roll, for though we may deny him the title of "father of the iron trade," or even that of the "inventor of puddling," there can be no question that to his ingenuity the industry owes a deep debt. If to him we add John Wilkinson and the veritable dynasty of Abraham Darbys, of whom the grandfather was born in 1677 and the grandson died in 1791, we have noted the

chief of those whose endeavors towards the improvement of processes connected with iron trade rendered it possible for the inventors of the railroad to make the fixed path of malleable iron produced in great quantities and at reasonable cost. It is not unnatural that the bulk of the names mentioned have been citizens of Great Britain. This country, from its physical configuration, its geological peculiarities and its limited size, presented the most favorable laboratory in which to try experiments. To these circumstances is due the fact that, at the beginning of the last century, one-third of the world's production of pig iron came from these islands, though the total production of the world did not exceed three-quarters of a million tons.

In every case it will be found that the production of iron depended on the proximity of fuel and ore. The iron trade of Sussex died when the exhaustion of the forests removed the fuel. Staffordshire, Scotland, South Wales, indeed every ancient seat of the iron trade in Great Britain, tell the same story, which is true of Sweden, of Russia, and of every country whence, before we entered on the new phase, we drew supplies. For it is interesting to observe that, in the past, England was an importer rather than an exporter of iron. From Sweden, which in 1780 was the chief producer, and from Russia she brought the metal which her smiths were to fashion into those goods for which she was early to become renowned. But though Sheffield holds and has long held the highest reputation for the excellence of her wares, it is significant that from Spain we derive Bilbao as a name for our sword, and from Syria the word damascening to describe the pattern with which it is adorned.

But neither Bilbao nor Damascus bears any part in the history of the iron trade a hundred years ago. We must look to Germany, to France, to Belgium, and to Austria if we would see how the continent of Europe stood at the date we are considering. It will be noted that I do not repeat the names of the two northern countries from which, in earlier days, Great Britain drew her supplies. Sweden and Russia barely count in the developments we are considering. From producing something like one-seventh part of the output of the world in 1830, they have fallen to producing but about one-eighteenth in 1905, though their total outputs have risen from about a quarter of a million tons at the earlier date to over three million tons at the later date.

The great ironmaking districts of Germany which lie in proximity to the Rhine owe their importance to the facilities of transport afforded by the river and by the railways which line its bank. The works at Essen date from about the time at which my review opens, for the firm of F. Krupp was founded in 1810, but it is not till 1850 that Westphalia begins to play an important part in the history of the trade. By that time, already, it had become possible to transport the ores of the Seig and the Lahn to the coal districts. The discovery of the Bessemer process marks another step in advance. Bessemer compels Westphalia to bring ore from Spain, Gilchrist and Thomas restore to the native ores their importance. The basic process marks a great stride, and in 1879 the astonishing development of the German iron trade begins, the production of basic pig iron rising to 8,039,808 tons out of the German pig iron production of 12,293,825 tons in 1906, whilst the output of Bessemer pig iron was only 491,086 tons. Again, it is the possibility of bringing ore from distant countries to the fuel needed to smelt it that this region owes its present position. It may be permitted to a subject of King Edward to point out that here too a citizen of these islands appears as taking a prominent part, and to recall the fact that one of the chief collieries in Westphalia is called "Hibernia," in honor of the nationality of the man to whom the initiation of the enterprise is due.

Among the other great works to which I should like to refer are those of Le Creusot in France which have a special interest to Englishmen as they were partly owned at one time—in 1823—by an English company, Manby-Wilson & Co., who purchased an interest in them from a French company. They date from a somewhat earlier period than that with which I am dealing, but it was not till 1836 that they passed into the hands of Messrs. Schneider, by whom they were rapidly developed, till they became the important establishment to which we were welcomed in 1899.

In Belgium the great establishments at Seraing call for mention. They interest us in this country since the founder was John Cockerill, a Lancashire man, who settled in Belgium early in the century to join his father in the management of a factory for the construction of spinning and weaving machinery, and in 1817 founded the works now under the management of our colleague on the council, Mr. Greiner.

Our approaching visit to Vienna would make me wish specially to refer to the part borne by Austria in the wonderful story I am attempting to tell. The Austro-Hungarian monarchy is also an example of the same process of development. The manufacture of iron dates from the remotest antiquity, but does not begin to attain to important figures till the introduction of improved methods of transport. In 1830 the output is said to have amounted to 80,000 tons. Fifty years ago this quantity had grown to just under a quarter of a milion tons, while today Austria-Hungary contributes over one and a half million to the world's output.

The American continent presents the matter in yet clearer terms. I may pass to 1810, when the make of iron was under 54,000 tons, which compares with 243,851 tons made in Great Britain. In 1840 this had grown to 286,903 tons against Great Britain's 1,396,400 tons. This slow growth continues, the United States not reaching the 1,000,000 tons, to which Great Britain had attained in 1836, till 1864, nor the second million till 1872. By this time, however, the means of transport were improving with extraordinary rapidity. The production pauses between the second and third million for seven years, the reaction of 1876 sending it below 2 millions (1,868,961 tons), jumps from 2¾ millions in 1879 to 3,835,191 tons in 1880, stays for five years between 4 and 5 millions, rushes to 5,683,329 in 1886, and so onwards till in 1905 it has attained 23,360,258 tons, out of the world's total of 54,610,269, to which Germany contributes 10,875,061, and Great Britain 9,608,086 tons.

Steam transport by sea and land, steam and electric-driven instruments for dealing with the ships' contents when they arrive at the discharging quay, have alone rendered these extraordinary results possible. The vast distances which so lately as 1890 make a judge as competent as my father doubt the possibility of utilizing the great deposits in the west have been reduced to insignificance, and the coal-fields of Pennsylvania placed, commercially speaking, alongside the iron deposits of Lake Superior, from which they are separated by 1,100 miles of land and water.

But precisely because the distances in Geat Britain were small, it was here that the first attempts to annihilate them by mechanical means were made. To this cause we must attribute the growth of the iron trade having in the earlier period been so much more rapid than elsewhere. When the century

opened, the production of Great Britain did not exceed ¼ million tons. Even thirty years later, it was considerably under ¾ million tons, and about half the total production of the world.

By 1830 the improved means of transport had begun to tell, and the progress in the mechanical arts to place better implements in the hands of the ironmasters. The next twenty years raised the British output to 2¼ million tons, out of 4¼ million tons for the world. In the following twenty years Britain more than doubled her output, which in 1870 reached 5¼ million tons out of 10½ for the world. By this time the means of transport first adopted in Great Britain had spread to other countries. The distances separating ore and fuel in America, in Germany, and in France were becoming of less and less importance, and by 1870 the total production of these countries was only about a million tons less than that of Great Britain. Ten years later, the three countries together produced as much as Great Britain. In 1890 she was called upon to yield the premier place to America. In 1903 Germany overtook her, and now, for the year 1905, which is the latest date to which we have complete statistics, the pig iron output of the world stands as follows:

Country—	Tons	Per cent of Total
United States	23,360,258	42.7
Germany and Luxemburg	10,875,061	20.0
United Kingdom	9,608,086	17.6
France	3,076,550	5.5
Russia	2,715,063	5.0
Austria-Hungary	1,540,896	2.8
Belgium	1,310,290	2.4
Sweden	539,437	1.0
Canada	403,449	0.8
Spain	383,100	0.7
Italy	143,079	0.3
Other countries	655,000	1.2
Total	54,610,269	100.0

This enormous quantity may well fill us with surprise. Some fifteen or twenty years ago my father expressed to me alarm at the rapidly increasing output of iron, and doubted whether the powers of consumption of the world were equal to disposing of the huge mass of metal. In this he followed Scrivenor, who, in the preface to the 1854 edition of his "History of the Iron Trade," remarks on the increase from 1,300,000 tons in 1840 to 2,700,000 tons in 1852, and proceeds:

"This did certainly appear a matter of sufficient importance to justify an inquiry—especially considering the striking events of the period which had elapsed—as to the causes by which this enormous increase had been encouraged, whether to the advantage of individuals as well as of the country, and whether the supply is likely to be supported, or, on the contrary, whether reckless make has not brought us to a position from which—unless mineral fields, at present unknown, come into operation, with similar advantages to the blackband ironstone of Scotland—we must retrograde....and reduce the manufacture to somewhat more moderate limits."

That these fears were in both cases unfounded the sequel proved. In 1854 Cleveland was just about to enter on the scene with a production which, in 1855, was under 100,000 tons, by the end of the decade was 248,655 tons, in 1864 was 409,106 tons, rose to 1,158,471 tons in 1874, and continued to grow till it reached 2,213,584 tons in 1900, and now (1906) stands at the estimated amount of 3,600,000 tons. Within the last twelve months we have seen the world short of iron and clamoring for more, the clamor taking a form which the manufacturers regarded with much complacency, for it resulted in a large increase in price.

And when we ask how the world, which a hundred years ago was content with considerably under a million tons of iron, today calls for more when we try to satisfy it with upwards of 50 million tons, the answer is not far to seek. The ingenuity of man was not exhausted when our grandfathers invented railways and steamships. Iron gives place to steel. The puddling furnace having served its purpose, is tossed aside for the Bessemer converter. An instrument with which the arduous labor of several men produced in twenty-four hours about 2½ tons of malleable iron, is rejected for one in which the forces of nature, guided by human skill, give us 30 tons of steel in twenty minutes. Iron, but sparingly used when the century opened, is demanded in continually increasing quantities today. The iron trade, responding to the call of the world, seeks new methods for producing still better results, and would seem to be about to reject the Bessemer converter for the open-hearth furnace. The remarkable invention of the regenerative furnace made fifty years ago is being continually perfected. Even now the great improvement of a continuous instead of an intermittent process is touched.

If we ask whence come these manifold perfectionments, we are led to look to another aspect of the question. Those to whom were due the great improvements which one hundred years ago were beginning to be effected were, on the whole, men who owed little to schools or colleges. "Self-made," as the expressive phrase goes, it was to their indomitable courage and energy that they owed success; to these and to that inborn perception of the possibilities presented to them which school or college seems to do nothing to create and little to strengthen. But the first barriers broken down, and the pioneers having shown the way, the carefully trained mind is needed to make straight the path. It must be admitted that we in this country have been disposed to neglect that careful training of the mind, and to rely on the native powers of insight more than on the trained intelligence. The workshop rather than the college was the technical school in Great Britain.

It is significant that we find a German Technical High School at Prague as being founded in 1806, that the Chausthal School of Mines comes next in 1810. Long before the century opened the School of Mines of Freiberg in Saxony was in existence, having been founded in 1765. In 1816 France appears on the scene with a School of Mines at St. Etienne. Belgium in 1836 contributes the School of Mines at Liege, and in the same year Spain that of Madrid, and Austria that of Leoben in 1840, while we have to wait till 1851 before the Royal School of Mines in London appears. Since then we have indeed given much more attention to this matter, and the air is filled with projects for supplying those educational facilities which our fellow-workers abroad possess in such abundant measure.

For as the tools in our possession become more complicated we must be better trained in their use. The empiric skill of the native genius, where imagination stands instead of knowledge, gives place to the learning acquired by the patient student at the technical school, and science supplants art at the furnace and in the workshop. If we in this kingdom are to keep our place in the world of industry, we must be ready to make use of the changed methods as our grandfathers were ready in their day to avail themselves of the forces newly placed at their disposal. For we, as they, look out on a world of perpetual change.

The men who stood on the threshold of the nineteenth century would have been filled wih astonishment could they have foreseen the changes it was to bring, giving us a world in which time and space are all but excluded from our calculations. A telegram with which we greet a distant friend in America reaches his hand hours before the sun has traveled westwards to mark there the same time as it marked here when our message was despatched. Jules Verne, by the exercise of his imaginative art, told us how with great good fortune his hero encircled

the world in eighty days. With no trouble to ourselves beyond taking a ticket from a tourist agency, we could travel westwards from London till we reached this city again from the east in a day or two more than half that time.

But let me picture to you one who, one hundred years ago, should have said to the most skilled and far-sighted man of that day, "Within a century from now corn grown on the western slopes of the Rocky Mountains will be conveyed by steam along an iron road to the sea coast, borne over the sea in a ship made of iron and propelled by steam, and sold in the London market cheaper than it can be grown in Essex." Not one of his anticipations would have been thought within the range of the barest possibility.

Beyond doubt we, who stand on the threshold of the twentieth century, may look forward to changes as great and far reaching before the next hundred years are run out. New forces are again being placed within our reach. The ultimate possibilities of the electric current are not yet within sight, though, with the eyes of faith, we may guess at them. It may well be that the steam-engine will be as obsolete as the horse gin before the twentieth gives place to the twenty-first century, and that the new machine will be in truth the heat-engine towards which the first experimenters worked. Our views of the constitution of matter are in a state of flux, and though the highly abstruse questions involved in this may seem far removed from these technical questions which chiefly occupy us, they are no more remote than may have seemed the discovery by Oersted of the deflection of the magnetic needle by an electric current. Yet that discovery contained the germ of the electric telegraph.

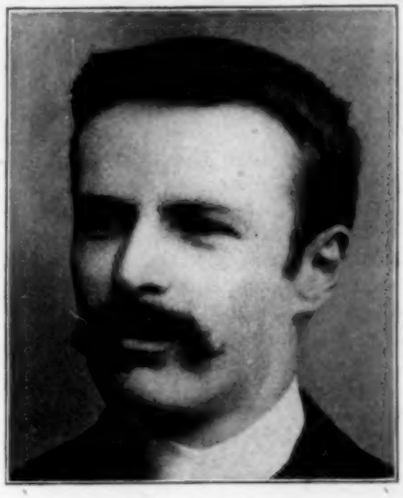
And if I today look forward, as I picture that other man to have done a century since, what form might my guess of the future take? How in a hundred years will the great swiftly-glding ship of those days be propelled? With little, or mayhap with no machinery on board, with barely any crew she speeds on her way drawn by the electric force generated at Niagara, and transmitted over the Atlantic by wireless telegraphy. She crosses to New York, takes her cargo, and returns as she came.

Strange as my forecast may seem, it is no more incredible than what has happened since 1807. The things which to us are commonplaces would have been deemed impossibilities by our forefathers.

The world moves on in a succession of dreams and their fulfilment. The wild imaginings of one age become the splendid realities of the next, for

"..... all experience is an arch wherethro'
Gleams that untraveled world whose margin fades
For ever and for ever when I move."

Sir William White proposed a vote of thanks to the president for his address, which he described as eloquent and interesting. They knew Sir Hugh as a close student of all that affected the social well being of the nation, but with all that machinery was doing, and with all their labor-saving appliances, those who had to do with the responsible management of large factories knew that there still remained as the underlying essential to success in the use of those



J. Newton Friend,
Carnegie Research Scholarship.

appliances the human element. Sir Hugh had taken a dip into the future, but when they remembered that the two new Cunard ships now building would require about 70,000 horsepower it was evident that the chairman's dream about utilizing the power of Niagara would not be fulfilled. But he quite agreed that they stood on the threshold of unknown possibilities.

The speaker concluded with a hope that when the chronological table was amplified, due recognition would be given to the introduction of steel-faced armor and nickel-faced armor and the introduction of mild steel into ship building.

Electricity in Rolling Mills.

Sir James Kitson occupied the chair for a short time during the temporary absence of Sir Hugh Bell to fulfill an engagement. The complimentary preliminaries being over the meeting settled down to more serious business, Mr. D. Selby-Bigge reading his paper on "The Development of Electricity in the Iron and Steel Industries."

J. M. Gledhill opened the discussion, describing the new apparatus as an original and novel way of driving the rolling mill. Some five years ago his firm built a mill for the rolling of armor plates, and they thought they had designed a thoroughly up-to-date engine with three cylinders and producing 10,000 horsepower. Apparently that engine was quite an obsolete piece of machinery. The speaker in a doleful tone said no doubt they must shortly offer it for sale, and if anybody wanted a second-hand piece of mechanism he would know where to get one. The whole question was one of economy, because he did not know that there was any suggestion that the new apparatus would produce any better plates. Having regard to the elaboration of the proposed mechanism, it was difficult to see where the economy came in, though the whole thing was no doubt very ingenious.

K. Kellen followed with a rapidly-spoken contribution to the discussion illustrated with various figures set out in chalk upon a blackboard. The speaker owing to his rapidity did not succeed in making his figures quite intelligible, and there was some good humored merriment at his expense as he resumed his seat. The paper, he said, gave a very complete and fine description of the plant at Trazynietz, but there were few statements which enabled them to calculate the productiveness of the plant. The speaker considered that the steam cost per ton would be from 2d to 2 2-3d against 5d per ton which electrical energy would cost, even if gas engines were available. Moreover the speaker had not mentioned that the installation of the cost of steam plant was from £20,000 to £25,000 cheaper than that of the electrical plant. It could not be supposed that the electrical driving would be of advantage for the rolling of rails, bars, girders, etc., this kind of work requiring less reversing, and the result being more equal. The speaker gave a number of details showing that steam would be much more economical. The speaker concluded that it would pay owners better to bring their steam engines up to date, and provide them with condensers than by introducing the electric reversing plant, while with blast furnace gases they could generate steam as well as electricity.

A. Cooper pointed out that the British system of mills consisted of the three-high mill with a heavy fly wheel and the reversing mill. The disadvantage of the heavy fly-wheel was the risk of breakdown, but many of them had pinned their faith to the reversing mill because it was economical. It would

run through a week from Monday morning to Saturday night without a breakdown, and that more than counterbalanced its really extravagant cost. The proposed plant seemed to possess the advantages both of the three-high mill and the reversing mill. He believed that several gentlemen present had seen the plant in actual operation.

Sir Walter Dixon, Glasgow, said he had seen the system at work not in a rolling mill, but in an apparatus which was very similar. The system really turned an intermittent action into a continuous one, and that really was the problem in a nutshell. It was a question of the storage of power; in other words if they wanted 10,000 horsepower they could put down plant for four-quarters of the mill, which would supply 2,500 horsepower. What Mr. Bigge had said about the simplicity of the working was quite correct, but Mr. Bigge's paper did not demonstrate with sufficient clearness where the question of economy came in; they in Great Britain sometimes found it better to adopt an unwise thing worked wisely, than a wise thing worked unwisely.

R. Hammond emphasized the fact that if the system proposed would reduce the boilers from 20 to 3 there could be no doubt about the benefit to the iron and steel industry. They had discovered during the last few years the grave importance of the loading factor, and if an engine could run with a full load continuously it would be sure to run much more economically than if they had an engine much larger with a varying load. He heard a few months ago that it was possible to use occasionally 10,000 horsepower with a 1,000-horsepower plant, and he received the statement with incredulity. But it was only possible to obtain 10,000 horsepower for one-tenth of the full time. With reference to liquid resistance, that was an element they did not like; that was caused by having a three-phase machine in the middle. Why not transform the high pressure three-phase to a continuous current, and have a machine so built that it would automatically change its speed; that would slightly add to the cost, but would remove a serious objection.

J. H. Harrison thought that on the score of economy the advantage seemed to be on the side of electrical driving. He had seen another plant where they were driving rolling mills by means of blast furnace gas engines, and they ran without any trouble at all. An essential point seems to be that the electrical mill-owner got his electricity practically for nothing; the only cost was the first cost, because the fuel cost was practically nil.

A. W. Richards pointed out that the process in the early rolling of the ingot seem to be rather slow, because of the frequent reversals, and they had to get a certain number of revolutions before they got a great speed; but that was obviated as the ingot lengthened when the speed would be greater and the reversals less frequent. A point of some importance seemed to be the great space required by the motors which seemed to reach 60 feet or fully twice that of the ordinary mill. That might not be a great consideration in putting down new works, but it would be serious in works already existing. The apparatus would cost a great amount of money, and he doubted whether they would get an adequate return for their expenditure. He would like further particulars as to the kind of boilers used and the evaporation per hour. They wanted more definite information as to the actual consumption of coal.

A. Tannett-Walker expressed the opinion that until they had all been to Vienna and seen this plant in operation they had better stick to their three-cylinder engines. The reduction from 54 boilers to 17 did seem to be something extraordinary. He did not quite see how that reduction of plant was to be effected; they knew nothing of the hydraulic accumulators, and personally he should wait until they had more figures which he would carefully study.

F. W. Paul considered they would be unable to arrive at a definite conclusion because the figures given were all mere assumptions, and were not applicable to any two mills by reason of the stoppages which were inherent to the doing of any work. There might be an advantage if they could have a central power station and all draw their load therefrom. Then economy might be as great as had been represented. Anything which would reduce the cost of fuel was worth consideration.

A. Lamberton remarked that they were all agreed that the question under consideration was purely a commercial one, and he did not think that steel makers would readily embrace any scheme of transition from steam-driven mills to electrically-driven mills that would involve them in a rolling cost of double the amount. He had come to the conclusion the paper was deficient in its information as to cost. He had been informed that it would cost not less than £30,000 to install a single mill, exclusive of the cost of electrical rolling, which would be quite double what it was with steam engines of the best type. That being so the paper must be supplemented by some figures which would give them data, with which to determine whether it could be a commercial success. He considered that the reversals could be as rapidly effected by steam as by electricity. He thought that the speaker had talked about controlling rolling mill cost when he really ought to have said that he recorded that cost. It was perfectly obvious that whether they used steam, electricity or water the amount of power employed must be equal in all cases. The great point was, whether they were able to reduce the load-peak on the main generator, and that would be the matter that would affect the pocket. The paper would be very incomplete until they got actual results, and he could not understand seeing that those works had been running for five months why they were not told the actual cost of production per ton.

Mr. Merz argued that the apparatus was purely an engineering and a mechanical rather than an electrical problem, and he was satisfied that it would result in a very small load and they would be pleased with the design. It was really a question of economy in cost of power. They had done things by electricity which could be done by no other means because of the possibility it gave to turn intermittent into continuous energy, but it was really impossible for them to come to any conclusion until they had seen the mill at work. The great merit was the leveling of the load factor, but capital would have to be spent upon generating plant.

Mr. Selby-Bigge briefly replied. He said that the time was already exhausted, and he could not deal adequately with the criticisms; for one reason, because he was not in a position to give further costs until they were published, which they would be in a short time, by the German engineers, and the directors of these works. He purposed to supplement this paper with a few further notes at the Vienna meeting which would deal fully with the figures based upon actual working operations. With regard to the rest of the discussion he would reply in writing.

A vote of thanks was accorded the reader of the paper, and the meeting adjourned until Friday morning.

At the proceedings on Friday there was a large attendance. The first business was a report by the committee on the Carnegie scholarships, which was read by Bennett H. Brough, secretary. It was to the effect that the council recommended that no gold medals should be awarded this year, but that commemorative silver medals be awarded to E. F. Law, A. R. S. H., London, and O. Stutzer, Ph. D. D., Freiberg, Saxony. The reports of these two candidates and the further reports by P. Breuil, Paris, Carnegie gold medalist, 1904, by Dr. Guillet, Paris, Carnegie research scholar, 1905-1906, and by W. H. Hatfield, Sheffield, Carnegie re-

search scholar, 1905 and 1906, were considered of sufficient merit to warrant their publication in full in the Journal of the Institute.

The council recommended that scholarships, each of the value of £100, should be awarded to C. A. Edwards, Horwich; J. A. N. Friend, Germany; D. M. Levy, Bradford; A. H. Portevin, France; and the scholarships each of the value of £50 should be awarded to A. K. F. Hiorth, Norway, and B. Saklatwalla, India and Germany. Mr. Law, it was explained, was trained at the Royal School of Mines, after becoming assistant to the late Sir William Austin at the mint, and is now practising as a consulting metallurgist. Mr. Stutzer was educated at four German universities, and is now a professor of geology at the Royal School of Mines, Freiberg, Saxony.

Arthur Windsor Richards then summarized the principal points of his paper on "Steel Making from High Silicon Phosphoric Pig Iron by the Basic Bessemer Process."

Steel from High Silicon.

The greater part of the morning was taken with the discussion on this paper, which appeared to arouse great interest. The chairman had on two or three occasions to intervene, to remind speakers that the reading of lengthy papers was out of order, and that speeches should be abbreviated. Some of the speakers introduced lengthy details which cannot be given in the space available.

Prof. Turner, Birmingham, said that the firm with which Mr. Richards was connected appeared to have solved a difficulty which had confronted steel makers for a number of years past. The fact that they could now do without the addition of manganese and without making any special basic pig iron would be a very great advantage. The omission of oxide of iron was an important point. They knew that in the ordinary Bessemer process whether acid or basic, they had a considerable loss because they had to make oxide of iron, and then had to oxidize away the impurities. The removal of that necessity, and the consequent diminution of waste was important. He believed some tentative experiments in the same direction had been previously made in South Staffordshire with some measure of success, but they were not continued for any length of time, and that the idea had been brought to practical success appeared to be due to Mr. Richards. He hoped the process would prove as satisfactory at other places as it had at Middlesborough.

Arthur Cooper said they had conducted some experiments on the same line at the North Eastern Steel Works, but they were unable to arrive at the same conclusion. One reason was that Messrs. Bolckow Vaughan had a large quantity of Cleveland stone at their back door, whereas his own firm had to buy and bring in its material. The large converting plant at Messrs. Bolckow's works supplied a large output, which, of course, had an important effect. The net result was that while his firm made a fairly good steel, it did not compare with the steel it made from ordinary basic pig, containing manganese, and the cost appeared to be appreciably higher, so that eventually the firm gave it up. He quite agreed with Mr. Richards as to the absolute necessity in the basic Bessemer process that phosphorus should be

B. SAKLATWALLA.
Carnegie Research Scholarship.

uniform. It was impossible to get good results if a charge contained 1½ per cent one minute and 2 per cent the next. After twenty years' experience he could say that it was as easy to deal with 2 per cent phosphorus and 3 per cent as with 1½ per cent. It was only a question of selecting materials. He did not agree with Mr. Richards that the smaller the amount of phosphorus the easier it was to conduct the process.

Vaughan Hughes said the papers seemed to be another indication of the value of scientific knowledge, plus imagination and initiative, but he would like some further details showing the analysis and tests of finished products.

P. C. Gilchrist remarked that no doubt the pouring off of the slag must be right, but it must be easier to get rid of the slag in the open-hearth furnace than in the Bessemer converter.

E. H. Saniter remarked that for years he had held the view that manganese was not necessary in pig iron, but he had heard many Bessemer people say they could not make basic steel without manganese. Mr. Richards had demonstrated that it was possible to make good basic pig from British ores at a reasonable figure.

E. Riley thought that manganese was not necessary if they had a perfectly pure iron, but in ordinary steel where they did have impurities they wanted manganese to act as a kind of physic. For ordinary metals it was a great question whether they could do without it.

F. W. Paul pointed out that the steel referred to was a hard gray steel, and the paper could not be conclusive with regard to a steel of low carbon such as was used for constructional purposes. He thought they ought to have some tests showing the result of the absence of manganese.

T. Twynam would like to have had a complete analysis of the slag poured off in the early part of the "blow." It had been said that no lime had been used, but it was a question whether lime did not come from the sides of the converter. Greville Jones pointed out that inasmuch as it was now possible to deal with iron made during the week-end, it must be a saving of five shillings a ton.

Windsor Richards replied, promising to give fuller details in the ultimate proceedings. He could not agree with Mr. Cooper that the process was more expensive; in fact, his firm had detected large economies. It was very expensive to put manganese in and to take it out again. He would give the further information asked for, but he had no doubt that the Bessemer basic process had got another long lease of life. It was quite true that the whole of the week-end make could go on the market and the cupolas formerly used by his firm had now been abandoned.

Steel from Pig Containing Chromium, Nickel and Cobalt.

Mr. Richards proceeded to read a summary of his second paper entitled "On Steel Making from Pig Iron Containing Chromium, Nickel and Cobalt."

This also was followed by a somewhat lengthy discussion. E. H. Saniter considered the subject novel and valuable; he was glad to learn that the process had been efficacious in the removal of sulphur, but it was still true that the tests given were not sufficient to demonstrate the elasticity and tensile strengths. Higher elasicity would give a greater number of reversals of stress.

Vaughan Hughes said he had conducted a series of experiments in connection with armor-piercing shells, and he had produced a steel closely resembling Mr. Richards' result, except that the carbon was more than 1 per cent. It seemed to show that there was a considerable advantage from the addition of those three metals to the steel. There was very considerable evidence of the utility of heat treatment.

J. Henderson, Thornaby, said he would like to know whether a pig iron with a maximum of 5 per cent of chromium could be easily worked in an open-hearth furnace. It seemed to him that that ore would be used solely as a specialty.

P. C. Gilchrist hoped that Mr. Richards would show how he had been so skilful in drawing off the slag in four or five times. Personally he had failed at it; but it was evident Mr. Richards had succeeded in giving engineers a beautiful material which would have very large uses. He supposed steel makers might confess that iron was sometimes better than steel for certain purposes; particularly, for example, for a small job like the axle of a bicycle, for which steel was a bad thing.

Arthur Cooper said he could confirm Mr. Richards' statement as regards chromium. So long ago as 1877 he received a consignment of pig iron made of Tasmanian ore, which contained 6.2 per cent of chromium. They made it into steel by including in the charge one-fourth of that chromium pig. The steel contained 0.24 of carbon, 0.87 of chromium, and 1.2 of manganese. They rolled it into rails, and were perfectly astounded at the result. It was predicted that the rails would break all to pieces, but they found they would bend like any other rails, and would stand any amount of punishment. They reserved that stock of Tasmanian pig and used it for special purposes. It enabled them to get over awkward tests on many occasions.

E. Riley said he well remembered that particular Tasmanian consignment in 1877, which amounted to 2,000 tons. He tried to use it, but he could do nothing with it in the way of puddling because the chromium was in layers, and it stretched out into the bar. He brought it to the notice of Mr. Cooper, thinking it might be used beneficially in important tensile strains of steel, and he believed that Mr. Cooper bought the whole of that pig at a very low price. His impression was that it contained about 2 per cent of sulphur.

C. E. Stromeyer said he had one sample of chromium steel which would bend perfectly well, immediately after rolling, but after twelve weeks it was absolutely brittle. The first sample bent to a right angle, but the next broke off quite short.

I. Lester said that many years ago his father was associated with some experiments with some of that very Tasmanian ore, and as far as he recollected it was kept in stock, and used for other than melting purposes. The men called it "Tasmanian devil" because of its peculiar hardness. Experiments were made both with acid and Bessemer steel and also for puddling, and years afterwards it was tried with the basic process, but with practically no results. It seemed to him that Mr. Richards' process was valuable, but it could hardly be regarded as perfect, seeing that he had to remove the slag practically by means of a rabble. One great result seemed to be that he was able to produce a steel roll. His own impression was that a South Staffordshire roll had generally been found the best in practical use. He thought they should get a final analysis of the whole of the slag, so as to show the condition of the slag throughout the whole course of treatment. The purer ores were rapidly being exhausted, and less pure ones might have to be utilized at a later time. The new system would then be of great value. He believed such ores existed in large quantities at one great center in India.

J. Duffield said that he had produced possibly eight million tons of Bessemer steel during his life, and on one occasion was troubled with chromium. As the speaker had explained, the chromium helped him out of his difficulties, and certainly his own experience was that he had made out of that material some of the best steel he had ever made in his life, and he had no doubt he could make steel with 3 or 4 per cent of chromium as good in quality as anybody could produce.

Mr. Richards briefly replied, and said it was quite true that the oxides must be very rapidly removed, otherwise they formed too thick a slag, becoming, in fact, as hard as bricks, and if not removed, it would be impossible after a while to work the bath at all. It was very important that the slag should not be too thick. His own experience with axles was different from that of one of his critics; in fact, they had substituted steel for iron and had never since had a broken axle, nor had they ever had any trouble with steel breaking after the lapse of twelve weeks. In fact, they had kept them from one to two years, and had found them as good as ever. They had added to the life of the roll by using this metal, and had had rolls which had outlasted ten pairs of the South Staffordshire rolls of which Mr. Lester spoke so highly.

The Vienna Meeting.

There was a little interruption of the proceedings at this point to enable W. Kestranek, Vienna, to make a statement regarding the conference to be held in the Austrian capital in September. As chairman of the reception committee of Vienna, he wished to say how greatly the Austrians appreciated the honor of the forthcoming visit, and they hoped to arrange an ample program. This statement was received with applause.

Mr. Brough, the secretary, followed with some details of the Vienna arrangements made at a meeting held at the offices of the Institute on the previous afternoon. The meeting in Vienna will commence at 10 o'clock on Monday, Sept. 23, at the house of the Society of Austrian Engineers and Architects, when the visitors will be presented with an address of welcome by the prime minister and by the governor, and by the lord mayor of Vienna, after which the president of the Institute will reply. Papers will be read as usual in the morning, and the afternoon will be spent with a drive through the city, visiting the chief objects of interest to be followed possibly by afternoon tea. In the evening the members with ladies will be invited to a performance at the opera. On the afternoon of the second day, there will be a garden fete with characteristic Vienna music, and the next day probably an excursion to the Alps, returning in time for the banquet to be held at the house of the Musical Society. Several alternative excursions will be arranged and there will be visits to principal iron works in the district, and to the Bohemian opera in Prague, an opportunity being given also to inspect the electric installation described in the paper read on Thursday by Mr. Selby-Bigge. Some distinguished noblemen and gentlemen constitute the reception committee.

Steam in Gas Producer Practice.

Resuming business, the meeting listened to a brief summary of the paper "On the Use of Steam in Gas Producer Practice" by Prof. W. A. Bone, Leeds, and R. V. Wheeler, Warrington. The professor pointed out that they did not wish to have their conclusions regarded as final until further

trials now in contemplation had been carried out.

An animated discussion followed, several speakers having carefully prepared somewhat lengthy statements.

R. Armitage, M. P., criticised the paper in some detail on the basis of some experience he had had at the Farnelly Iron Co.'s works, Leeds. His firm, he said, gave it as its confident opinion that to attempt to run its gas producer plant at three-quarter load with any of the slags it had ever used or tested, and with the blast saturated with steam at 60 degrees Cent., would result in the shutting down of the plant within a week, with the producers thoroughly clinkered.

When the proportion of steam was increased, more of it would go through the fuel undecomposed. By arranging such regenerative plant as that of the Mond superheaters and towers it was retained, and the heat of the steam was largely recovered, and so the convenience of using blast saturation at a temperature of 80 degrees Cent. was combined with high thermal efficiency. If a still higher temperature was used of 85 degrees Cent., the best ammonia recovery with high thermal efficiency, and still greater freedom from clinker, were all obtained by that plant. The enormous disadvantage resulting from the presence of large quantities of steam would not only outweigh any possible advantage resulting from the presence of tarry vapors, but would make a varying percentage of gases an absolute impossibility. The Mond equipment had proved itself a valuable and reliable apparatus. They had to recognize the necessity of cooling the gas to extract the steam.

Axel Sahlin said the authors had endorsed the objection which he had himself found in practice. They used thermometers and pressure gages in the way that Dr. Mond suggested, but the effort was not successful unless the personal equation was taken into consideration. They had spent thousands of pounds in boilers while they had grudged hundreds in producers, and had not, therefore, got a satisfactory result. It was essential that they should conserve the chemical reaction more than had hitherto been done. Dr. Bone put his paper in such a practical and intelligible form that it would be useful to the man who operated the furnace, as well as to the man of technical training.

B. W. Thwaite said the paper illustrated the proper combination of scientific and practical knowledge, and he hoped some of the professors would follow that line in daily work. The perfect power gas was distinct from furnace gas, and would contain 30 per cent to 32 per cent carbon monoxide and not more than 7 per cent hydrogen. It appeared that the local consumption was equivalent to 150 tons at 10 hours a day and it would be unprofitable to put down a by-product recovery plant.

A. H. Lymn said there were a large number of engines running in Great Britain on the Mond principle under ammonia recovery conditions, in which the hydrogen was between 25 per cent and 28 per cent. It was an obvious misapprehension to say that steam saturation was raised to 80 degrees Cent. That was quite double that used in the Mond recovery product.

Perry Nursey remarked that tar

C. A. EDWARDS.
Carnegie Research Scholarship.

luminosity was quite unnecessary in the operation of the furnace. The writers had simply proved that when a producer worked with a large amount of undecomposed steam that must be removed before it was suitable for furnace purposes, but that fact had been recognized by all builders, and had been provided for. A superheater was always necessary where large amounts of steel were desired.

The meeting had shown some impatience over the lengthy reading of a paper by this speaker and the chairman asked the following speakers to make their remarks as brief as possible, reserving details for newspaper correspondence.

Victor Stobie stated that he had installed some producers at the works of the Sheffield Annealing Co., but it was annealing some bars for the crucible trade and had no oxidation of the bars. He burned the air in the gas and the bars came out, if anything, better than when they went into the furnace. Bars covered with scale were entirely freed from rust, and the superheated vapors were easily split up. He hoped the paper would dispel the idea that water was fuel; and they must expect to reduce thermal efficiency if they injected steam.

Prof. Walter Dixon said there was no steel works which had put down producer gas purely with the idea of ammonia recovery. The authors had come to the conclusion that if they wanted good gas they need not expect much ammonia, but if they wanted plenty of ammonia, they must not trouble about the gas. He thought that view was probably correct. The conclusion arrived at was that if they wanted to use the gas in a reheated furnace they must reduce the ammonia.

Prof. Turner, representing Birmingham University, congratulated Prof. Bone on the undertaking of a new department of the Leeds University, from which this was the first paper they had received. They knew the excellent work that had been done by Prof. Dixon at Manchester in connection with flame, and it was very gratifying that Leeds proposed to deal with this branch of the subject.

Prof. Bauermann thought it would be useful if they could have the ratio of air to water in the blast used. If he was right, he understood that the lowest percentage at 60 degrees was about 13 per cent of water. They had been in the habit of mixing from 5 to 7 per cent of water, and he thought that was as high as they were to go if they were to keep up the temperature, and not produce too much carbonic acid. He had the greatest respect for the Mond producer, but he thought it should be worked in its entirety. When they began to have an ammonia regenerator, it began to lose its advantages. Where ammonia was of secondary importance, a lower percentage would seem to be desirable.

Prof. Bone replying said that details would be dealt with in correspondence, but he would point out to the critics that they had distinctly disclaimed any intention of discussing the efficiency of the Mond system, which was outside their scope. It had been said that a steam saturation at a temperature of 60 degrees was an impossibility, if the plant was worked continually; but it had been so worked for months together, and in Germany work had proceeded for a whole year at 45 degrees with no clinker trouble

at all. They proposed to continue that work.

Influence of Process of Manufacture on Steel.

The paper by F. W. Harbord on "The Influence of the Process of Manufacture on Some of the Properties of Steel" was briefly introduced by the author and was discussed by P. C. Gilchrist, who thought the hardness was due to the dissolving of oxygen from oxide of iron. It would be an advantage if particulars were given grouping the Bessemer process and the open-hearth process.

Ageing of Mild Steel.

The next paper was on "The Ageing of Mild Steel," by C. Stromeyer.

C. E. Saniter pointed out that a great effect was sometimes produced on the metal by being heated and cooled frequently. The tendency in such cases was for the bar to become shorter and thicker. He knew one that had been shortened in this way six inches in twelve months. The intermittent working of boilers would have the same result. The speaker gave several instances of iron that had broken short after a lapse of time.

G. Ainsworth said that if they came to the conclusion that steel was going to turn bad in about twelve weeks he feared theirs would be a short-lived trade. When they thought of the hundreds of thousands of tons turned out yearly, and considered how few boiler explosions there were that pointed immunity from accident to a different conclusion to those of the author. Then there were cases of ships bumping on rocks on the other side of the world, and coming home with their plates bulged but otherwise uninjured. The cases mentioned by Mr. Stromeyer must be exceptional.

W. Rosenheim pointed out that the metal appeared to have given way where there had been great local stress, as in shearing. The strain did not injure, when it was more widely distributed as with ships. The true way would be to lay in a stock of material and test bars at stated intervals. J. Duffield thought that the fracture might be due to blow holes in the steel. But another reason might be a slight crack in the ingot which gradually extended as it was worked. D. Colville thought it was the stress that had caused the trouble. F. Paul cited an instance of Low Moor iron put into the Niagara bridge thirty years ago, which when taken out was within 5 per cent of its original strength. Vaughan Hughes thought from his examination of sporting gun and rifle steel that the breakages were due to the external strain rather than the effect of age.

Mr. Stromeyer replied, pointing out that in the case of boilers he thought it was a mistake to have repeated hydraulic tests every year, as it did more harm than good and weakened the boilers. The effect of heat might have the same effect as that of time. He proposed to continue his experiments. He thought that material which would fatigue very easily would possibly not age materially, and vice versa.

Induced Draft for Boilers.

The last paper introduced was one on "Induced Draft with Hot Air Economizers for Steel Works and Blast Furnace Boilers" by A. J. Capron, Sheffield.

There was no time to discuss this, and an informal vote of thanks was merely quoted the writer.

The proceedings concluded with the customary vote of thanks.

The Annual Dinner.

The annual dinner at the Hotel Cecil on Friday evening, the 10th inst., proved to be a very notable gathering, its distinctive feature being the remarkable number of distinguished guests, who occupied positions to the right and left of the chairman. To the right and left of Sir Hugh Bell were their excellencies Count Herman Wrangel, the Swedish minister, and Count Albert Mensdorff, the Austrian-Hungarian ambassador.

Two American representatives were present, Messrs. W. R. Webster, of Philadelphia, and P. Schlicht, of New York. The guests were unusually numerous, totaling about 400.

The usual loyal toasts having been honored, the president specially including the young Prince of Asturias, whose birth was announced a couple of hours before, the toast of "The Imperial Forces," was proposed by Robert Hammond, M. I. C. E., treasurer of the Institution of Electrical Engineers. Mr. Hammond emphasized the fact that the armaments of the world, and especially of Great Britain were dependent upon the skill of those engaged in the iron and steel industry. The toast was acknowledged by Admiral Sir Cyprian Bridge and Col. Sir Howard Vincent.

The toast of "Our Guests" was proposed by Sir James Kitson, Bart, M. P., a past president of the institute, who mentioned that at no previous dinner had they had such a gathering of distinguished guests. The number of illustrious names was too great even to be enumerated. They had come to show their respect for the great trade dealing with the material on which the development of the empire and of science depended. Without the iron and steel trade, "Dreadnoughts" would be mere matters of imagination. He could not help recalling in the presence of the Austrian ambassador that on their visit to Vienna 25 years ago, they had in that beautiful city a most gracious reception. He hoped to see a still larger assembly in Austria than was present that evening. He remembered also that when they went to Sweden they were entertained with great magnificence by the king of Sweden and in France all the great works were open to them, and their reception was marked by all the "camaraderie" which distinguished that great nation. They might say that it was not a silver chain that bound them together, but a bond of steel which belted the world.

The toast was drunk with great heartiness and acknowledged by his excellency, Count Mensdorff. It was pleasant, the speaker said, to hear that the Institute included men of all nationalities, while it was a source of untold wealth and the origin of the most important undertakings, as well as of the most formidable engines of destruction. Those members of the Austrian iron trade present would tell them that preparations were being made to give them a most cordial reception in Vienna, and to make their visit as interesting as possible.

Count Wrangel also responded. The friendship, he said, between Sweden and Great Britain had been increased by the visit of nine or ten years ago, and the links which bound them together were stronger than ever. He hoped that another visit might soon be undertaken.

Yves Gyot, who also acknowledged the toast, said one could usually measure the degree of civilization by the quantity of iron used. When they remembered the enormous progress that had been made in the present century, and that the industry had been completely transformed within a single generation, they might well ask what would be the power of the iron industry at the end of the twentieth century?

The toast of "The Iron and Steel Institute," which was the toast of the evening, was proposed by the Right Honorable Lord Justice Fletcher Moulton. In a very able speech his lordship said iron and steel were the great giants that held up the work of the world, whether in peace or war. The metal was applied to the most contradictory uses and its protean

strength was due to its ability to turn its hand to anything. He could imagine no greater contrast than the behavior of the steel projectile that would go through 24 inches of metal, without noticing or blunting its nose, and the tiny wire that held the powerful apparatus which drove the projectile. There was a wide difference between the iron of the armor plate and that of the surgeon's knife, which showed how well they could adapt themselves to all wants. The motor industry well illustrated the variety of their service, for in a single motor there was almost every kind of metal, of different specifications. He had been fascinated and muddled by the theory of alloys. They were all working for cheapness, but he remembered an old saying that it was "no good saving on bootlaces, if they wanted to save they must save on boots," and they were all in search of economy in great expenditure. They had with them the distinguished survivor of the author of the basic process which invention gave value to millions of tons of British ore, and they were still working at various economies in the way of hastening time and getting rid of useless waste as well as of effecting small economies in fuel. One of their most important achievements was to give equal certainty in their processes to the ordinary individual and the man of genius, and it was no small sacrifice for the leaders of the industry to get rid of their secrets and make their valuable knowledge common to all. [Applause.]

Sir Hugh Bell responded in a neat speech. He was inclined to accept the compliment that their trade was the atlas on which the progress of the world rested. It was quite true that their processes were far from monotonous; if they erred at all they erred in showing so rapid a variety and it developed that a process confidently adopted as the latest thing, had in two or three years to be thrown aside as entirely valueless. He had lived long enough to see the conditions of trade alter three times in the short period of half a century and more changes had taken place during that period in the conditions of the world than during the 30 centuries which preceded them. Their industry made a demand upon every intellectual faculty possessed by man. With regard to economy they in the iron trade had not only to consider the boot laces but give many weary hours to the tags. [Laughter.] A fraction of a penny had occupied him for hours and hours which he would gladly have devoted to pleasanter subjects, and a penny on the ton in the world's make of pig iron would make him happy for the rest of his life, and above the necessity of considering whether pig iron was 28 shillings or 82 shillings per ton. [Laughter.] But it was no use bothering about the laces if they had not the boot. Even now there were processes in which the skillfully trained hand and eye of man surpassed everything that could be done by science.

A solitary cheer at this point led the speaker to ask whether that applause came from a Sheffielder. [Laughter.] Anyhow he was about to say how much they admired the skill and experience gained by trial and error which enabled the artificer to forge so simple an implement as a sword that showed how human skill untrained by scientific knowledge, and which had enabled the human race to make any progress pos-

ALBERT HIORTH.
Carnegie Research Scholarship.

sible at all, had compassed undertakings which would otherwise have seemed impossible.

With regard to the variability of trade, which seemed such a peculiarity of their industry it was curious that when men began to do anything they always started by wanting iron, and they had a very disagreeable habit of all wanting iron together. At another time, they left them alone in a very disagreeable way. That was the root reason why the trade was so variable, but as usual, good sprang out of evil, because when the profitable times come, they are able to spend any money that might be wanting and to conduct the industry in a way which he believed on the whole redounded to the good of the world. The sun sometimes shone upon them and sometimes the cloud overspread them, but as the poet Browning said, "The world goes in and through, and out again of the cloud."

Some of the Authors and Medallists.

The following are brief sketches of men prominent at the Iron and Steel Institute meeting:

C. A. Edwards, recipient of a Carnegie research scholarship, was born in Canada in 1882. From 1898 to 1902 he was in the foundries of the Lancashire and Yorkshire Railway Works, Horwich, and from 1902 to 1905 in the chemical laboratory of the same works. In 1905 he became an assistant in the metallurgical department of the National Physical Laboratory, remaining there until the present time. He was the appointed author of the eighth report to the Alloys Research Committee, and has recently been appointed a fellow and demonstrator in metallurgy at the University of Manchester under Prof. Carpenter.

Joseph Henderson, author of the paper on "Distribution of Sulphur in Metal Ingot Molds," was born in Darlington, England, in 1869. He was first educated at Albert Road Board School, and at the Darlington Grammar School. He then entered the laboratory of Messrs. Pattinson & Stead, receiving four years' metallurgical training under J. E. Stead, F. R. S. He next joined the staff of Messrs. W. Whitwell & Co., Thornaly Iron Works, Thornaly-on-Tees, taking charge of the laboratory. He holds the position of lecturer in iron, steel and practical metallurgy at the Middlesboro Technical Institute, and is top of the honor's list, City and Guilds iron and steel examination 1899, and is consulting chemist to Messrs. Head, Wrightson & Co., Ltd., Thornaly.

D. L. Selby-Bigge, author of the paper "Electrically-Driven Reversing Rolling Mills," was born at Bourton in Shropshire in 1864 and was educated at Marlborough Christ Church College, Oxford, and the Electro-Technical Institute, Montefiore, attached to the University at Liege under Prof. Gerard. He was first employed at Vienna in connection with the electric lighting contract of that city. In 1888, he became connected with the firm of Clark-Chapman-Parsons & Co., and was also connected with the Newcastle District Electric Lighting Co. In 1890 he founded the firm of Messrs. D. Selby-Bigge & Co., electric power engineers at Newcastle-on-Tyne, and carried on a large amount of pioneer work in connection with the application of electricity to steel works, ship yards and mines. The framing of the new Home Office rules on electricity in mines was largely based upon the evidence given

by Mr. Selby-Bigge before the Electricity in Mines Commission. He has been the author of three papers before the Iron and Steel Institute at its London, Brussels and Dusseldorf meetings, and has read two papers in French before the Ingenieurs Sortis de L'Ecole de Liege and the Ingenieurs de Mines de Mons, and has contributed papers to the Cleveland engineers, Manchester Society of Engineers and other technical institutions.

C. E. Stromeyer, the author of the paper on "The Ageing of Mild Steel," studied engineering and graduated at Aix-la-Chapelle and was subsequently engaged in Palmer's ship building yard on the Tyne. After spending one or two years at sea, he became engineer-surveyor to Lloyds register of shipping, holding that position for 17 years. In 1897, he was appointed to the position of engineer-in-chief to the Manchester Steam Users' Association, which post he still fills. On two occasions he has received the Telford premium from the Institution of Civil Engineers, and once this was accompanied by the award of the Telford medal. Mr. Stromeyer is a member of the general council of the National Physical Laboratory.

Thomas Swindon, who contributes a paper to the Iron and Steel Institute meeting on "Carbon-Tungsten Steels," was educated at the Central High school, Sheffield, and at the University college in the same city, entering in the metallurgical department of the latter under Prof. J. C. Arnold. He obtained City and Guilds of London Institute certificates in metallurgy for ordinary and honors courses, and with the former was awarded a bronze medal. He has contributed several papers to the University Engineering and Metallurgical Society, and has presented a paper on "High Temperature Measurement" before the British Foundrymen's Association.

R. V. Wheeler, who presents in collaboration with Prof. W. A. Bone a paper on "The Use of Steam in Gas Producer Practice," was born in 1883 and educated at Plymouth college and Owens college, Manchester, graduating with honors in chemistry and metallurgy in 1903. He became a Dalton scholar, and in 1904 was made a fellow of the university. In 1905, he was appointed chemist to Monks, Hall & Co., Ltd., Warrington, which position he still holds.

Harry Brearley, who is the joint author with F. C. Moorwood, of "Sentinel Pyrometers and Their Application to the Heat Treatment of Tool Steel," started working in the crucible furnace, but accidentally became bottle washer in the chemical laboratory of Messrs. Thomas Firth & Son in 1883, and later became chief assistant at Kayser Ellisons Steel Works. He was chemist from 1900 to 1903, writing, during this time, "The Analytical Chemistry of Uranium," and in collaboration with Mr. Ibbotson, "The Analysis of Steel Works Materials." He is now the managing director's assistant of Messrs. Firth Works in Riga, Russia.

Edward Fulton Law, recipient of a Carnegie research scholarship silver medal, received his metallurgical training at the Royal School of Mines, of which he is an associate. He afterwards became assistant to the late Sir William Roberts-Austen at the Mint, and is now practicing as a consulting metallurgist.

Otto Stutzer, who also receives a Carnegie research scholarship medal, was educated at Bonn and Breslau and at the Universities of Konigsberg, Tubingen, Munich, and Heidelberg. He is at present assistant Professor of Geology at the Royal School of Mines, Freiberg, Saxony.

John Albert Newton Friend, who received a Carnegie research scholarship, was educated at King Edward's High School, Birmingham, where, as "King Edward's Scholar" 1900-1902 he graduated as Bachelor of Science. He continued his studies as "Priestley Research Scholar" 1902-1903, and graduated M. Sc. in 1903. He is at present a research student at Wurzburg University, and has contributed accounts of his various researches to the Transactions of the Chemical Society.

Donald Myer Levy, a Carnegie research scholarship man, was educated at the Bradford Technical College and subsequently at the Royal School of Mines. He was awarded a research scholarship in metallurgy at the Royal School of Mines and is now assistant lecturer and demonstrator in metallurgy at the University of Birmingham. He was the holder of a national scholarship at the Royal School of Mines and was awarded the Edward Matthey prize.

Byranji Saklatwalla, another recipient of a Carnegie research scholarship, was educated at Bombay and Charlottenburg. He took the course for the degree of Bachelor of Science in physics and chemistry at St. Xavier's College, Bombay, and the course in metallurgy for the degree of "Diploma-Ingenieur" at the Royal Polytechnic School of Charlottenburg.

Albert Hiorth, also awarded a Carnegie research scholarship, was born in 1876, and obtained his early education at the Christina, Norway, Cathedral School from 1882 to 1891, and then worked for a year in the machine shop and foundry of Kverner Brug, after which he attended the Christina Technical School from 1892 to 1907. The following two years he constructed turbines and wood pulp machines with Kverner Brug, and afterwards studied at the University of Geneva from 1898 to 1899. In 1900, he was awarded a bronze medal for drawings in Paris, and since that time has been partner and confidential clerk in the firm of F. Hiorth, Christina. The last three years, he has carried on theoretical and laboratory work at home and abroad on the electric smelting of iron and steel, and has read several papers thereon before the Polytechnical Society of Christina. He is the inventor of the Hiorth continuous induction furnace.

SOUTH STAFFORDSHIRE IRON AND STEEL INSTITUTE.

The annual meeting of the South Staffordshire, England, Iron and Steel Institute took place on April 27, at the Station Hotel, Dudley, Mr. William Somers, the retiring president, and a junior partner of the firm of Walter Somers & Co., Ltd., Halesowen, in the chair. The secretary, W. H. Carder, reported a membership of 47 honorary and 241 ordinary members, with a credit balance of £156. R. Buchanan was elected president, and W. J. Foster, vice president of the Institute, H. Piper being re-elected treasurer, and W. H. Carder secretary. It was decided that the annual excursion should take place on June 19, and that the works of Williams & Robinson, and the British Thomson-Houston Co. at Rugby should be visited.

The annual banquet took place in the evening, the newly-elected president presiding. H. Pilkington, president of the Foundrymen's Association, proposed "The Iron, Steel, and Coal Trades," George Hatton (Lord Dudley's Round Oak Works) and Alderman Garratt responded. The mayor of Dudley proposed "The Institute." The president, responding, expressed the belief that the iron and steel trades of the Midlands would not only be maintained, but would be increased. Other toasts included, "Kindred Associations," "The Past Presidents," submitted by H. Piper, and replied to by William Somers, and "The Guests," proposed by the president, and responded to by Aldermen G. H. Dunn, and John Hughes.

The Federal Furnace Co., of Chicago, has completed arrangements for a bond issue of $1,000,000. The bonds are for the purpose of improvement and development and are secured by the present plant of the company on the Calumet river between 107th and 109th streets.

Astonishing Achievements on the Mesabi.

Office of THE IRON TRADE REVIEW,
411 Providence Bldg.,
Duluth, Minn., May 20.

The preparatory operations during the past winter for the open pit mining of this season have produced surface changes in some districts of the range which are amazing. It is distinctly up to every contemporary in mining or excavating work to take off his hat to the mining men and methods of the Mesabi range. Other mining propositions are difficult, requiring brains and skill and other digging operations present their problems, but for immensity and rapidity of operating combined such performances as have been carried out at Hibbing, Eveleth, Virginia, McKinley and elsewhere on the range during the past five months at temperatures below zero are beyond the range of comparison with anything else. Any adequate conception and true appreciation of the stupendous work in progress is impossible without seeing for one's self and then it is more amazement with which one is inspired at the magnitude of it all than a realization of the cost, labor and yardage involved. In the Hibbing district alone the Oliver Iron Mining Co. stripping on the Sellers, Hull-Rust, Burt, Morris, Pillsbury and other mines has removed from Nov. 1 to May 1 close to three and a quarter million yards of surface. This would mean a single pit approximately a half mile square and 12 feet deep.

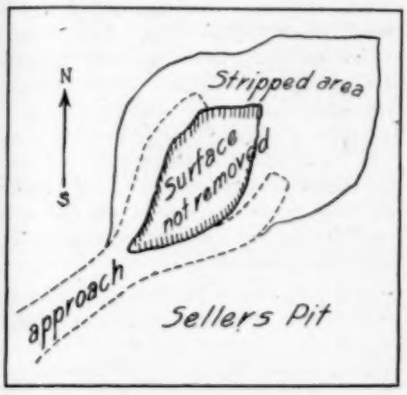


FIG. 1—SKETCH OF SELLERS PIT

In October last the Sellers pit was nothing but two through cuts as shown by the dotted lines in the sketch Fig. 1. Now it is a pit extending over an area of a comparative size roughly shown by the full lines in the same sketch and having a depth in the bottom cuts of 50 or 60 feet. A view of the pit just taken for the IRON TRADE REVIEW is given in Fig. 2. Fig. 3 is a view of the stripping equipment at the Burt mine where the work is being done by Winston-Dear & Co. It contrasts the narrow gage locomotives and dump cars with the standard equipment shown in the Sellers pit and used almost altogether by the Oliver Iron Mining Co. The small cars are 4-yard and the large cars 7-yard with 42-ton locomotives.

The continuance of the work all through the winter which, with one or two previous exceptions, is an innovation this year, indicates a new policy outside of the fact that the increased amounts of ore shipped from the open pits demand a greater amount of preparatory work between seasons, it has been decided that the disadvantages of winter work with its additional strains on equipment, the maintenance of water lines and personal comfort are more than compensated for by the preservation of the working organization. Heretofore the cessation of steam shovel work for instance during a few months has necessitated either the laying off of a large number of shovel runners and firemen or of shifting them to temporary and unsatisfactory positions whereas continuous operation preserves the working force intact, a condition which is increasing in advantage each succeeding year. The Sellers pit will not be ready for ore-shoveling until the latter part of the season, as there is still some 20 feet of surface to be removed. The Hull-Rust pit where the heaviest work has been carried on is a second Mountain Iron and in rapidity of development has even surpassed the other mine. Last year its initial shipment was close to a million and three-quarters tons and this year it will ship approximately the same as Mountain Iron, or a million tons more than last season. It is a wonderful mine and a fitting neighbor to the Mahoning with which it forms a continuous pit.

From the rough sketch Fig. 4, an idea of the stripping and development work done this winter and the general shape of the pit as it now is, can be gained, the dotted lines indicating the surface unstripped at the close of last season. At present there are four shovels stripping and four in the ore and shipping here is more nearly up to full capacity than at the other pits. In fact, at the Burt but one shovel is working in ore, operations being held up by the stripping. At the Morris there are three shovels in ore and four stripping. During the winter considerable surface has been removed on both sides of the pit, and with the completion of the new approach and the shifting of tracks a large quantity of ore has been released. At present both approaches are being used for hauling out ore. Next to the Morris at the Albany, they are digging in ore with one shovel and stripping with one. This stripping was begun last fall to make room for steam shovel mining instead of the milling system and now the mills are not being used at all. The Greer Contracting Co. is doing the stripping and is using the Lima geared locomotives with which it is pulling three 4-yard cars up a grade close to 5 per cent and around an unusually sharp curve without any apparent difficulty, even starting up on

FIG. 2—VIEW OF SELLERS PIT, LOOKING TOWARD EAST BANK

the grade. A large amount of ore has been uncovered and it is being hauled in small cars from the shovel to the bottom of the shaft in the side of the pit and hoisted to the top. This is fairly cheap mining and avoided the cutting of an approach into the pit, which is small and already pretty deep.

At the Pillsbury, about 700,000 yards of surface have been removed with from 300,000 to 500,000 still to be stripped. A view of the pit is shown in Fig. 5. The same methods as have always characterized the work at the Mahoning will be continued this year with the production probably greater than last year; at least, that will be the attempt. There are just now two shovels in the bottom of the pit and one up on the north bank in the ore just uncovered last year. Although it has been supposed that the ore body at the Mahoning was long ago thoroughly explored and outlined, there are this spring five drills in the center of the pit where the most ore has been removed, evidently seeking information.

The Brunt, Croxton and La Rue mines of the Pittsburg Iron Ore Co. are in very good shape for the season's shipments. The last named is somewhat behind its schedule at present, owing to boat delays, but being a steam shovel proposition can be forced for a time without difficulty and with good weather should ship about 40,000 tons in May. The Nassau and Hobart have not started to ship, but the former will begin about June 1, depending on how soon the development work will permit.

FIG. 3.—STRIPPING AT THE BURT WITH NARROW GAGE EQUIPMENT.

Equipping Furnaces.—The Woodward Iron Co., Woodward, Ala., is equipping its No. 2 furnace with a new skip incline and an improved, automatic Baker & Neumann distributing top, and David Baker, engineer, of Philadelphia, has recently closed with the Alabama Consolidated Coal & Iron Co. for a similar equipment, to be applied to its No. 1 Ironton furnace. These improved distributors are exceedingly simple in construction and give rotary distribution automatically without the use of ball bearings, gears or motors.

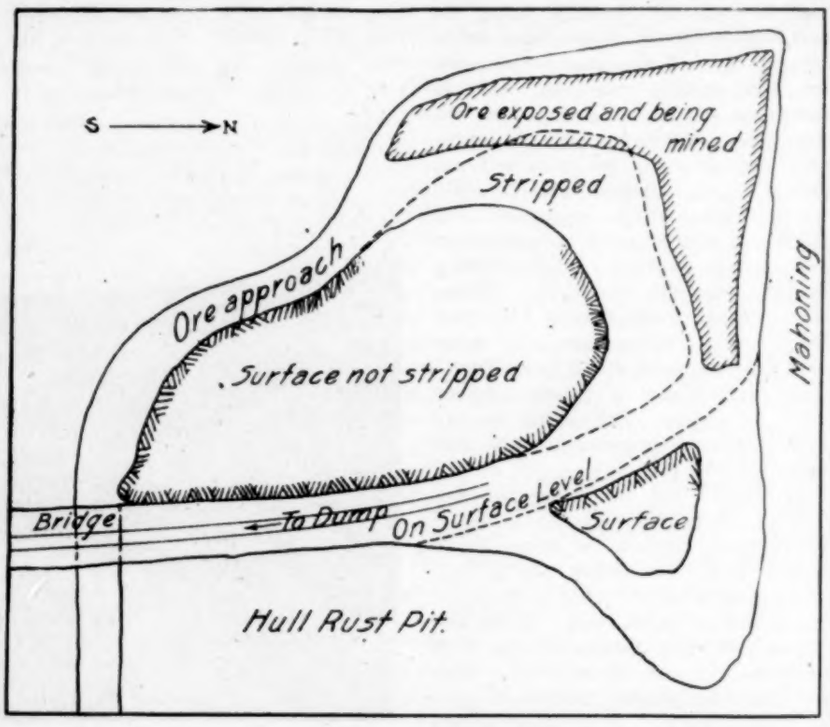


FIG. 4—HULL-RUST PIT

FAIR TREATMENT

URGED IN THE TRAINING OF APPRENTICES.

Discussion at the Convention of the National Machine Tool Builders Association at Fortress Monroe, Va.

(Staff Correspondence.)

Fortress, Monroe Va., May 18.—The early sessions of the semi-annual meeting of the National Machine Tool Builders' Association, held at the Hotel Chamberlin, Old Point Comfort, Va., were reported in the last issue of THE IRON TRADE REVIEW. At the concluding sessions of the assemblage, which completed its work late Thursday afternoon, a number of topics of wide interest to the trade at large were discussed and the way was paved for important innovations and improvements.

The subject of apprenticeship, with the many complex problems which the working out of a satisfactory system involves, was brought up through the report by E. P. Bullard, of the Bullard Machine Tool Co., Bridgeport, Conn., of the special committee designated by the association at a previous meeting to investigate the entire situation and present an outline of an ideal plan applicable to the shops of all the members. This report was, in its way, a monumental work. It was

based on such data as could be collected from a considerable number of plants within the association and outside, together with that acquired by an extensive series of experiments conducted at the Bullard works. Its preparation involved a very extensive correspondence and disclosed the keen interest which the apprenticeship question has produced throughout the metal working industry.

It is probable that in an early issue the plans recommended by Mr. Bullard and associates can be presented in detail. Briefly, the report provided for a dual system; on one hand calculated to give the apprentice a broad, well rounded training for general machine shop work of all classes, and on the other aiming with a shorter term of apprenticeship to produce the machine shop "specialist" only,—not an all-around man, but a capable, intelligent operator for some particular form of tool. For the former class a schedule of wages was presented, starting with a figure at which the economical youth can support himself, and gradually increasing through his term. In the special apprenticeship class the term is considerably shorter, ranging from one year, as in the case of training for the operation of drilling and grinding machines, for instance, and one and one-half years for erecting and scraping operators, up to two years for turning machine men. Here the pay of the beginner is somewhat higher, as the necessity of winning a living or something better often causes the youth to enroll as a special apprentice, where the prospect of good wages is nearer, and larger inducements are needed to secure enrollments in this class. Provision is made, however, for giving proper credit in case the apprentice, after completing a special course, desired to fill out his training and work out a full apprenticeship. The report dealt in detail with the form of contract to be drawn up, the equipment of tools for the apprentice and other important phases of the problem.

The Factor of Encouragement.

Following its presentation, this report was discussed at length, the keynote of the views expressed being the necessity of the fairest kind of treatment for the apprentice.

"Don't put the boy at sweeping out the shop," said one member. "Pick him out carefully: be certain that he is of the right sort and then treat him with consideration. In the past there has been too much of shoving off the old tools on the apprentice, and then leaving him to shift for himself, to pick up what he can with no one to see that he is given the instruction he needs. Give him a good set of tools, see that he is shown how to use them and that, as soon as he is capable of handling it, he has work which will make him respect himself. When there's a promotion to be made, look around and find some one who has worked himself up from the ranks. If the boy knows that 'the boss was an apprentice once' he will feel that there is some future for him. Maybe he will stay in the shop: maybe you will find him more useful elsewhere. Every now and then an apprentice will turn out to be a first rate salesman."

Mr. Bullard reviewed the history of the apprenticeship experiments conducted at the Bridgeport shops, where some thirty boys were obtained by plainly-stated advertisements in the country papers in that section. Living wages were paid and from the start the results were gratifying. In a relatively short time they developed into better operators than could be hired outside. The hiring of handymen has been stopped and the boys are taking their places.

Another phase of the matter emphasized in the discussion was the sentimental effect upon the boy of having in his possession the apprenticeship papers. It was also pointed out, as an argument against the payment of wages unduly high, that the essential feature of apprenticeship is "the opportunity to learn:" the boy is given the opportunity to use expensive tools and to spoil work. Provision was made in the report for the granting to the apprentice, upon the completion of his term, of a diploma bearing the seal of the national association. The recommendations of the committee were adopted entire and it was continued, with the addition of C. H. Norton, of the Norton Grinding Co., Worcester, Mass., to its membership.

FIG. 5—PILLSBURY PIT

The association listened to brief reports on the attendance of its officers at the November meetings of the Society for the Promotion of Technical Education and at the more recent gathering in Washington in the interests of the extension of American export trade. It adopted a touching memorial, presented by Fred L. Eberhardt, on the death within the past six months of H. J. Hendey, Edward P. Bullard, Joseph Flather and Henry C. Hoefinghoff, a quartette of leaders in the machine tool trade and the organization. A message of greeting from the National Supply and Machinery Dealers' Association, voiced by Henry Prentiss, of the Prentiss Tool & Supply Co., was

received and a message of appreciation and cordiality was returned. The convention devoted the remainder of the Thursday morning session to making some minor changes in the constitution.

Some Foundry Difficulties.

How to deal with the foundryman who delivers a casting from a sprung pattern, who changes cores about promiscuously and never remembers to return patterns when the castings are completed was considered at considerable length Thursday afternoon. Certain tool builders, it appeared, have been greatly annoyed by mistakes arising from lack of system in the foundries to which their work is let. In some instances, this has led to the necessity of devoting the time of one or more men to visits to these foundries, checking up patterns before they are placed in the sand, seeing that cores are in their correct places and that blue prints have been followed, and chasing the elusive cores and patterns which fail to return. One member thought it traditional with foundries to make such errors frequently, but others told of overcoming the difficulty by securing a more explicit contract with the foundryman, by insisting on system in his plant and by making other connections in case his mistakes continued. This, it was declared, would secure truer castings, particularly if on larger work the tool builder saw to it that a pattern foreman or draftsman checked up the patterns before casting. The difficulties of the making of castings were detailed and attention called to the allowances necessary for these reasons. One brief solution offered was:

"Tie up to one foundry until you are taking nearly all of its output. Let things run that way for a while. Then buy a farm near your town and let the foundry people know you are planning a foundry of your own. Then you'll get castings without flaws and true to pattern."

The subject was referred to the foundry committee with instructions to formulate a policy for determining the responsibility of foundrymen and report at the next meeting.

The convention considered the advisability of adopting a standard form of guarantee similar to that issued by automobile manufacturers, and left the question in the hands of Murray Shipley, of the Lodge & Shipley Machine Tool Co., Cincinnati, and Mr. Bullard.

Standard Size Catalogs.

A canvass of the convention showed a majority of members using the so-called "standard size" catalog, six by nine inches: six use the larger standard, nine by twelve, and one the small size, three and one-fourth by six.

Exposition Exhibit Problem.

When the subject, "Do Exhibits at Railway Conventions and Automobile Shows Pay?" was brought up, the overwhelming opinion was manifested that, except in instances where the tool manufacturer has something new and unique to introduce, returns are by no means commensurate with expense. This condition is in contrast with the situation abroad, as European agents insist that exhibits at expositions and shows are necessary for selling goods there and arrange the displays when tools are furnished. In the exposition way in this country the convention was agreed that matters have been badly overdone in this country. The larger expositions, it was admitted, have their effect in distributing knowledge of machine tools, but the Chicago fair was the only one to which any member told of tracing profitable returns. But one association member is exhibiting in machinery hall at the Jamestown exposition and his machines are only partially uncrated. Various members reviewed their experiences with one or more expositions as exhibitors and more recently with the wily solicitor with show space to dispose of, and finally the association arranged for a standing committee to investigate the status and merits of expositions and shows as they develop and report to the organization their value as places of exhibiting tools. This committee consists of F. M. Huschart, of the Bickford Drill & Tool Co., Cincinnati; E. C. Henn, of the National-Acme Mfg. Co., Cleveland; C. E. Thwing, of the Whitcomb-Blaisdell Machine Tool Co., Cincinnati; C. J. Whetsel, of the Bausch Machine Tool Co., Springfield, Mass., and C. H. Besly, of C. H. Besley & Co., Chicago.

The convention, as is customary, was entirely devoted to business and was devoid of social features. The many matters coming before it were disposed of within the limits arranged, through the efforts of President Woodward and Secretary Montanus. Most of the members were accompanied by their wives and remained over at the Chamberlin for a few days while visiting the exposition just across Hampton Roads. Those attending the sessions were:

Those in Attendance.

E. M. Woodward, Woodward & Powell Planer Co., Worcester, Mass.
P. E. Montanus, Springfield Mach. Tool Co., Springfield, O.
Israel H. Johnson Jr., I. H. Johnson Jr. Co., Philadelphia.
A. E. Newton, Prentice Bros. Co., Worcester.
B. B. Quillin, Cincinati Planer Co., Cincinnati.
C. Wood Walter, Cincinnati Milling Mach. Co., Cincinnati.
Geo. F. Stewart, Bradford Machine Tool Co., Cincinnati.
Edward Rivett, Rivett Lathe Mfg. Co., Boston.
P. G. March, Cincinnati Shaper Co., Cincinnati.
H. H. Klusman, Greaves, Klusman & Co., Cincinnati.
E. D. Westry, Rockford Machine Tool Co., Rockford, Ill.
F. P. Huston, Kempsmith Mfg. Co., Milwaukee.
Robert C. Lind, Rockford Mach. Tool Co., Rockford, Ill.
W. C. Buell, Builders' Iron Foundry, Providence.
V. F. Hatch, Builders' Iron Foundry, Providence.
F. M. Huschart, Bickford Drill & Tool Co., Cincinnati.
C. E. Thwing, Whitcomb-Blaisdell Mach. Tool Co., Cincinnati.
Fred L. Eberhardt, Gould & Eberhardt, Newark, N. J.
C. H. Norton, Norton Grinding Co., Worcester.
H. W. Breckenridge, Colburn Mach. Tool Co., Franklin, Pa.
C. J. Whitsel, Bausch Mach. Tool Co., Springfield, Mass.
E. A. Muller, King Machine Tool Co., Cincinati.
Robt. S. Alter, American Tool Works Co., Cincinnati.
Murray Shipley, Lodge & Shipley Mach. Tool Co., Cincinnati.
Chas. Hilker, Hamilton Machine Tool Co., Hamilton, O.
F. E. Reed, F. E. Reed Co., Worcester, Mass.
E. P. Bullard, Bullard Mach. Tool Co., Bridgeport, Conn.
E. C. Henn, National-Acme Mfg. Co., Cleveland.
J. H. Dohner, National-Acme Mfg. Co., Cleveland.
J. B. Doan, American Tool Works Co., Cincinnati.
C. H. Besly, C. H. Besly & Co., Chicago.
D. W. Wright, Henry & Wright Mfg. Co., Hartford, Conn.
L. E. Brayton, Builders' Iron Foundry, Providence, R. I.

Firms Are Damaged.—A disastrous fire in the Chicago machinery district recently drove out a number of firms and closed the offices of others for several days. The seven story building at the southeast corner of Canal and Washington streets was partially destroyed and three buildings to the south also occupied by machinery firms were damaged by falling walls. Some of the firms in the building and their estimated losses were: M. E. Griswold, machinists supplies, $3,000; Curtis & Co., mill machinery, $2,500; Puster Brothers, belting and machinery, $10,000; E. C. Atkins Saw Co., $10,000; Wallace Machinery Supply Co., $3,000; New York Leather & Belting Co., $8,000; McElroy Belting Co., $10,000; Marvin Smith Co., farm implements, $30,000; Chicago Bindery & File Co., $15,000. The building adjoining, 46 Canal street, occupied by the Cleveland Twist Drill Co., was damaged by the falling wall as well as the next building, 48 Canal street, occupied by the Norton Co., and the Norton Grinding Co. Slight damage was done to the building occcupied by the Standard Scale Supply Co., and Adkins, Young & Allen Co., 50-52 Canal street.

PRESIDENT McFADDEN

Reports Progress and Plans of the American Foundrymen's Association.

The following is the address of President McFadden delivered at the Philadelphia convention of the American Foundrymen's Association:

Gentlemen—I count it an honor to be able to preside at this, the twelfth convention of the American Foundrymen's Association. The eleven years of life of this association coincide with eleven years of progress in the American foundry industry. I cannot properly eulogize this organization for the part it has taken in the wonderful advancement in this important branch of the iron trade. I can say no more than that progress in the American foundry began with the birth of the A. F. A. and that the development of "ye ancient" to our modern foundry has been largely due to the enlightening influences of this association. We have but to think of one of the many lines in which the foundry has advanced; then go back in the proceedings of our association and find that it began with a question or a suggestion of some member at one of our meetings; it was later made the subject of a paper and discussion; then offered to a committee for study and report; and finally given to the foundry industry in our journal.

Foundry Metallurgy.

For example, foundry metallurgy was among the earliest subjects brought before our association for discussion, and our proceedings contain papers which have proved of inestimable value to foundrymen in the development of this branch of foundry practice.

The foundrymen began with experiments on the effects of silicon on iron, its influences were studied and the results were explained at our meetings. Differences of opinion were frequently manifested, but the knowledge gained proved of great benefit to foundrymen. Experiments and discussions soon brought out the fact that silicon was but one of several elements which exerted a marked influence on cast iron. This led to a study of the effects of other impurities, and has resulted in the development of foundry metallurgy into an exact science.

There is no longer any excuse for the uncertain hit or miss methods formerly used for in mixing foundry iron. Our proceedings contain material, which, if intelligently applied, should allow the foundryman to shake off the shackles which bind him to the ruts followed by his forefathers.

It is a surprise to me that the opportunities offered by metallurgy are not more universally taken advantage of, as the foundry metallurgist has explained many of the problems formerly thought unsolvable. Where metallurgy is not a success in a foundry, it is due to the lack of knowledge of the one who seeks to apply it rather than to any defect in our present knowledge of the science itself.

Standardized Drillings.

In order to aid the foundry chemist to obtain uniform results, this association developed a series of standardized drillings of cast iron which have become the arbitrator in nearly every laboratory in America. While these drillings are now under the Bureau of Tests of the United States government, their inception and preparation resounds greatly to the credit of our association.

Standard Methods for Analysis.

Hand in hand with the work of standardized drillings has gone the work of standard methods for analysis of iron. Started some years ago, the work has since been in the hands of our metallurgists. After four years of hard and painstaking labor, their committee has at last succeeded in placing before our association a series of standard methods. Their adoption, for use in cases of dispute, will greatly aid in preventing dissension between the buyers and sellers of pig iron. The secretary and committee have worked arduously for the association and deserve great credit for their results.

Standard Methods for Testing Cast Iron.

The work of this association formed the basis for the standard methods for testing cast iron adopted by the American Society for Testing Materials. The data published in connection with this work, in our proceedings, is of itself an encyclopedia on cast iron, giving, as it does, the analysis as well as the strength of a large number of characteristic irons. It is to be regretted that these specifications have not met with more universal usage; it is possible that they do not fulfill the requirements of founders and, if this is so, steps should be taken to remedy the defects. Cast iron will maintain its position in the future solely by the intelligent application of some method of testing, which will give the engineer an accurate knowledge of its strength in the casting as it makes up a component part of the machine.

Standard Methods of Buying Pig Iron.

The work of the association in bringing about the adoption of standard specifications for buying pig iron deserves mention. The old method of buying by fracture is rapidly disappearing and the modern method of buying by analysis is rapidly taking its place, much to the advantage of both the buyer and the seller. This happy condition of affairs is largely due to the work of this association and the publicity given the matter by its proceedings.

Standard Methods of Foundry Cost Keeping.

We have before us another matter which deserves the careful attention of every foundryman, viz., methods for keeping foundry costs. All foundries have some method, however crude, for ascertaining costs of castings. A careful study of these methods reveal the fact that many of them are not only incomplete, but very misleading. The association should assist in the development of some simple system which will give accurate costs. This should be a foundation, as it were, on which those foundries desiring to go into detail could build and still preserve the principles of the standard method.

Some system is essential to remedy the uneconomical working conditions which exist in our jobbing foundries. Some method should be adopted for properly distributing the general expense or burden of a plant so as to enable the foundryman to ascertain just what class of work was profitable for him to make and what should be left for some other to handle. An intelligent system would lead to a rearrangement in bidding on work which would cause a much improved condition in our jobbing foundries.

Affiliated Associations.

This address would not be complete without a reference to our Associated Foundry Foremen. Its growth has rivaled our own association, and the results of its formation are very apparent in a desire on the part of the foremen to improve their knowledge of foundry matters. I have read, with much interest, the accounts of the meetings of the different sections, and of the topics which they have for discussion. Such an interchange of ideas along educational lines is a healthy evidence of an advanced state in our foundries. This association is aiding its members to improve foundry conditions by intelligent consideration of those subjects which are of paramount interest to our foundries.

Supply Association.

It is my pleasure to welcome to our midst the new affiliation of our foundry supply fraternity—"we always have them with us"—but this year it is in a brand new guise. Individually, they have been hard to resist, collectively, it behooves the foundrymen to beware. Seriously, the closer association of the foundrymen with those who supply us with materials cannot fail to work for the benefit of both. Too much credit cannot be given to those who have met every demand of advanced conditions in the foundry with improved materials. The exhibi-

tion of foundry devices at our convention will prove of value, not only to the seller, but to the buyer. The latter is better able to judge the value of a machine for his own work by watching it operate, than by seeing it in print or in the eye of the sales agent.

This is especially true in regard to the molding machine. Your president would venture the prediction that this most valuable adjunct to our foundry is in its infancy. Conditions are forcing the founder to adopt them whether he will or not, and the exhibition of the most modern types at our conventions, where they may be discussed by foundrymen, will do a great deal towards advancing their use.

Brass Foundrymen.

We are welcoming the brass foundrymen of the country to our meetings this year, affording them the benefit of our experience, and aiding them to form a brass foundrymen's association. It gives me great pleasure to welcome them to our meetings, and I trust that Philadelphia will prove as good a father to their association as it has to the American Foundrymen's Association.

Foundry Education.

Education is the keynote of our organization; there is a decided interest prevalent at the present time in foundry education. Our organization should therefore be in the forefront of this movement. Many papers upon educational subjects have from time to time been read before this association and different projects have been discussed for establishing foundry schools.

The association has a committee on technical schools which has acted in conjunction with a Pittsburg Foundrymen's Association committee in regard to a foundry course at the Carnegie Technical Schools in Pittsburg.

Five instruction papers have been published by the A. F. A., and more are in process of completion. These papers are elementary and are intended to give general instruction in different branches of foundry practice.

Aside from the above, this association, by its papers, discussions, committees and exhibits acts as a general educator to the American foundry.

It would, however, seem advisable that this association take a more active part in shaping the educational sentiment so active at present. The question is complex, and it is not my intention to discuss it to any extent in this address. I shall rather point out what has been frequently overlooked, viz., that no one course would cover all the ground referred to by those discussing this question. The classes to be educated are technical men for superintendents, engineers, metallurgists and chemists, and industrial men for foremen, molders, apprentices and handymen.

Three different schools, or courses, would be necessary to advantageously benefit all of these conditions. Our technical schools should so equip themselves as to properly teach the first class mentioned. It is obvious that they are not at present fitted to do so. It is the duty of the members of this association, both as an association and as individuals, to exert their influence in such a manner that technical schools will give more intelligent attention to this important branch of industry. In order to accomplish anything of value, the technical institutes should be urged to provide instruction by scientifically educated men who have had practical foundry experience. Courses and equipment should be supplied to give a practical as well as a theoretical foundry training; such instruction should develop men who, in a short time, would be able to work into foundry superintendents and engineers.

The education of foremen, molders and apprentices presents a different problem. In localities where trade schools with night courses exist the problem is simplified. The value to the student then depends entirely upon the instruction given. The trade school should teach such branches as would aid the foreman to become more proficient, the molder to be a better molder and fit to assume the position of a foreman and the apprentice to master his trade. Localities favored with trade schools where foundry practice and allied subjects were intelligently taught, would soon become the supply depot of foremen and superintendents for the country.

The third school should educate handymen and make them proficient with their hands and brains, thus enabling those who have been unable to learn a trade to improve their condition. Such schools are, however, being maintained by other organizations and do not come entirely under the scope of this association. The subject is, however, a vital one to foundrymen and the scarcity of competent molders together with the disposition in some quarters to restrict the number of apprentices make it one which may well be borne in mind.

Fluxes and Alloys.

A paper recently read before the Pittsburg branch of our association called attention to fluxes and alloys in a very interesting manner. Our foundries are, from time to time, flooded with all kinds of quacks for the improvement of cast iron. It is not possible for the foundryman to separate the "chaff from the wheat," and consequently all are generally classed as "bad" for lack of proper facilities for determining their efficiency. It would seem to be within the province of this association to have these materials investigated for the benefit of our members.

Permanent A. F. A. Testing Department.

Our association needs a permanent department for investigating the problems which are continually arising in connection with our industry. If this department could be installed in connection with one of our technical schools, it would be of great value to our association. Unsolved problems in regard to iron could be investigated in an impartial manner. Sands, fluxes, alloys, core compounds and blackings could be studied and tested much to the benefit of the manufacturer and the consumer. Our foundrymen, from an economic standpoint, could well afford to maintain such a department, for it would soon be shown that many of the materials used in our foundries are carrying much more than a legitimate profit.

The American Foundrymen's Association.

The American Foundrymen's Association stands for progress along educational lines. Under the guidance of our worthy secretary it has achieved a reputation in America, in England, and on the continents as a strong and progressive organization. We, as members, certainly owe it to the association to maintain this position.

Soon after becoming president, I ascertained the fact that the work of the association was hampered by lack of funds. The income was entirely dependent upon the dues of the members; an increased membership meant an increased constant revenue. I have consequently devoted my term to securing new members for the association and about one hundred and fifty have joined this year. This does not, however, make the income of the association sufficient to increase the scope of its work.

At the New York meeting the dues were reduced from $10.00 to $5.00 per year, with the idea that the membership would be more than proportionally increased. This was not the case, however, and, after consulting with many members, your retiring president advises that the dues be again increased to $10.00 so that the association may accumulate a fund which will make possible a permanent testing bureau.

Journal of the A. F. A.

In answer to some two thousand letters sent out this year in the interest of our association, I have had many inquiries as to our journal which has been formerly published in various forms. A journal would be of great benefit to the members of the American Foundrymen's

Association, but to publish one with our present income would be out of the question. If the dues were changed back to $10.00 with our increased membership, we should have no trouble in issuing a journal which would prove of great value. It is very easy to assent to the request of your president, vote for a journal, and then go home and think no more about it until next year. Our secretary would need the support of every member were he again to publish a regular organ. The entire life of this association should not be bound up in one annual meeting. The members should be kept in touch with one another by a progressive journal. There is more interest in our work than ever before and the time is ripe for a movement which will bring a majority of the foundrymen of the country into the ranks of this association. This can only be accomplished by the united efforts of all our members.

In closing, I desire to publicly express my thanks to our honored secretary, Dr. Moldenke, for his proficient and untiring efforts in behalf of this organization and for his unfailing courteous assistance to me during my term as president.

I wish to thank many of you for kind words of encouragement and to urge you to be loyal to your next president in deeds as well as words. Should he ask you to obtain one new member do not again ignore the association which has done so much for your chosen industry.

My congratulations to the Philadelphia foundrymen, to the Foundry Supply Association, and to our secretary, for the able way in which they have handled the arrangements for this twelfth gathering.

I wish personally to express the obligation of this association to those who have so faithfully labored in the production of papers for these meetings.

Our conventions happily combine three important phases of foundry work —the educational, as illustrated in our papers; the mechanical, as demonstrated by our exhibits; and the social, as dispensed by our hosts. Let us, for a few days, forget the cares of the foundry and freely partake of the educational and social feast which is so abundantly set before us.

Fellow members, prosperity has brought increased responsibilities in the form of vexing problems which are before many of us for settlement. Your retiring president wishes you all a continuation of this prosperity, and he looks forward to a future in which the enlightening influences of this association shall have permeated the foundry industry and so broadened the employer and the employe that they may meet without strife on the common ground of mutual helpfulness.

RICH IN PROMISE,

BUT UNFINISHED, IS THE JAMESTOWN EXPOSITION.

Building the Pennsylvania Tunnels. —Exhibits of Steel Companies. —Power Still Lacking.— Many Things in the Packing Box Stage.

(Staff Correspondence.)

Fortress Monroe, Va., May 20.—The Jamestown Ter-Centennial Exposition was formally opened April 26, amid a storm of criticism over its unfinished state. In the four weeks which have elapsed since that time, much has been accomplished, but even now, except in the case of the government exhibitions, only occasional sections of the buildings are anyway near completion, so far as the installation of exhibits and their arrangement are concerned. The buildings, outside and in, present all the disappointing features of a great undertaking only half accomplished. Here a well-designed and appointed booth, with an exhibit of general interest, will attract the visitor something after the manner of an oasis in a desert. He will start toward it, winding about piles of packing cases and dodging the omnipresent carpenter or truckman with a cry of "Gangway!" When the attendant at the booth attempts to tell something of the exhibits it contains, his voice is drowned in the clatter of hammers and the buzzing of saws.

That is one disappointing phase of the exposition, as it appeared to an editorial representative of THE IRON TRADE REVIEW, who visited it late last week. Another is the semi-finished condition of the roadways and walks. The soil of the exposition grounds is sandy, but with the proper proportion of rain it becomes a very respectable grade of mud, all of which prompts the visitor to wonder at the many uncompleted stretches of cement walk and roadways. Great cement tanks will be beautiful, clear pools,—someday; probably about the time the exhibits are all in place and the War Path attractions conclude the crowds are big enough to justify their opening.

On the other side of the story there is something to be said. The exposition promises to be one of considerable beauty and interest. Its financial difficulties have been overcome, it is understood, and exhibitors who have not been afforded facilities for arranging their booths or have been subjected to a series of annoying delays are now making considerable progress and will be ready within a comparatively short time. Then the exposition will well repay a visit. Below is given a brief review of some of the leading features of interest in iron, steel and machinery lines:

The Machinery and Transportation Building.

Transportation exhibits occupy a large part of this roomy structure, and of these the great booth of the Pennsylvania Railway System is perhaps the center of interest. This exhibit concerns itself wholly with the gigantic operations of that railway in tunneling North and East rivers as well as Manhattan Island and a considerable section of the New Jersey and Long Island route adjacent to New York. The exhibit is grouped about a section of the huge iron and concrete tube which is to form the wall of the sub-aqueous tunnels. This section is shown actual size, with concrete shelves at either side of the roadbed, and with tubes to accommodate a number of wires imbedded in concrete beneath the shelves. For the sub-aqueous work, where cast iron tubing, made of castings milled and bolted together, is used—concrete tubing being utilized where the tunnel runs above the water line—it is interesting to note that a total of 172,000 tons of castings will be required. This is being delivered at a very low price, in comparison with those now prevailing, as the contracts were let in the quiet period of 1903. Two tunnels are to run under the North river and four under the East river. Terminal arrangements are shown, in addition to a small model illustrating the method of driving the tunnels, and a model showing the entire tunnel route from end to end.

The Pullman Co., Chicago, has an all-steel Pullman sleeping car on inspection. The Chesapeake & Ohio occupies considerable space with a complete train, the "F. F. V. Limited," with locomotive. The J. G. Brill Co., Philadelphia, has taken a large section and is putting in an exhibit of street cars.

The booth of the General Electric Co., Schenectady, N. Y., in one corner of this building, is interesting in that it contains a well-arranged exhibit which is of practical use as well, inasmuch as it serves as an exposition sub-section.

Nearby, the Cambria Steel Co. is putting in an extensive exhibit. The Shelby Steel Tube Co., Pittsburg, shows a unique booth constructed entirely of steel tubes of various sizes. The Moran Flexible Steam Joint Co., Louisville, Ky., shows a miniature model of the cruiser Louisville, built up of pipe joints and plates.

Power transmission concerns are represented by several booths. That of Chas. A. Schieren & Co., manufacturers of "Duxbak" belting, although uncompleted, promises to prove an attractive display. At the rear of the booth is to

be a large painting on glass with "real water" coming through a hidden opening in the glass and falling constantly on "real Duxbak belting." At the close of the exposition this will be tested in a practical way to prove its waterproof properties. The New York Leather Belting Co., New York City, is arranging its exhibit in a large section, and the Baltimore Belting Co., Baltimore, Md., is also represented. Rope drives, etc., are shown by the Durable Wire Rope Co., Boston.

In the way of machine tools, it is interesting to note that only one member of the National Tool Builders' Association is represented in this building. The Detrich & Harvey Machinery Co., Baltimore, has a couple of planers on the grounds and will shortly have them installed. One of the most attractive booths in this department is that of the Simonds Saw Mfg. Co., Fitchburg and Chicago. This is open on two sides, the other two walls illustrating the manufacture of the saw from the beginning of the process of making crucible steel. A wide variety of saws is shown, one large section being arranged so that glittering circular saws can be operated,—that is, when the exposition management gets around to the question of arranging for power. The center of the booth affords best facilities.

The Allis-Chalmers Co., Milwaukee, in a large space, shows a saw mill carriage, rock and ore crusher, a belted Reliance engine, induction motors and the Christensen air-compressor set and air brake. This exhibit is unique in that it was complete on opening day.

The Atlas Engine Works, Indianapolis, has taken a large space, but has not yet installed its exhibit. The American Boiler Economy Co., Philadelphia, shows its boiler feed regulator and Copes automatic pump governor.

William C. Robinson & Son Co., Baltimore, has an attractive exhibit of lubricating oils, with the oil flowing from several barrels. W. C. Meadows & Son, Poors Knob, N. C., show gas engines and other machinery.

The Bird Archer Co., New York, and the Crandall Packing Co., Palmyra, N. Y., are arranging a joint booth. The Peter Gerlach Co., Cleveland, has an interesting section devoted to its stave and heading machinery. The S. A. Woods Machine Co., Boston, is also represented.

Manufactures and Liberal Arts.

The Expanded Metal & Corrugated Bar Co., St. Louis, has an attractive showing of its corrugated steel bars for concrete reinforcement, the back of its booth being lined with photographs of buildings in which this bar has been used.

The Belle Isle Industries, Richmond, Va., including three concerns, have a well-arranged booth. The Virginia Pipe & Foundry Co. exhibits an assortment of cast iron pipe and fittings. The Richmond Forgings Corporation, manufacturer of drop forgings, shows gear blanks and auto and miscellaneous forgings. The Old Dominion Iron & Nail works presents a variety of stay-bolt iron, spikes and horse shoes.

One entire end of this building is devoted to the exhibit of Virginia shoe manufacturers. This shows in full operation a complete equipment turned out by the United Shoe Machinery Co., Boston.

Mines and Metallurgy.

One of the interesting features of this section is the Ohio exhibit of ceramic and mineral products, including fire and building brick, terra cotta, pottery and china. A part of the exhibit is enclosed in a wall built up of blocks of various kinds of brick, in contrasted colors. This exhibit is practically complete.

Considerable attention is devoted in this building to Portland cement, though all of the exhibits of this product are far from completion. The Universal Portland Cement Co., Pittsburg, the Lehigh Portland Cement Co., Allentown, Pa., the Sandusky Portland Cement Co., Sandusky, Ohio, and the American Cement Co., Philadelphia, are among those now at work on their exhibits here.

A small section devoted to abrasive and grinding wheels gives promise of much interest a little later. Among the exhibitors will be the Norton Co., Worcester, Mass.; the Carborundum Co., Niagara Falls, N. Y., and the Pike Mfg. Co.

The exhibits of coal and coke, particularly by West Virginia and certain other of the southern states, while still in an uncompleted stage, will prove of wide interest to visitors a few weeks hence. The Davis Colliery Co., Elkins, Va., is arranging a miniature representation of a coal shaft in operation and is at work on other spectacular features. In a neighboring section Pocahontas interests are at work on an extensive showing of coal, together with samples of coke and views illustrating its manufacture. Already in place is a block of Pocahontas coal four by four feet and showing a ten-foot section of the No. 3 vein. This weighs eight tons. In certain of the separate state exhibits, coal, coke and iron ore play a prominent part, but these for the most part are still in the packing-box stage. Mine cars manufactured by the Kilbourne-Jacobs Mfg. Co., Columbus, O., are much in evidence.

In this building the Primos Chemical Co., Primos, Delaware Co., Pa., shows a large cabinet of manganese, vanadium, tungsten, etc., with a variety of these alloys of steel and a number of articles manufactured therefrom. The Roessler & Hasslacher Chemical Co., New York, is rapidly geting its exhibit in shape.

Separate buildings are to house a number of large exhibits, notably the American Locomotive Works, the Baldwin Locomotive Works, the Clyde Iron Works, the Middleton Machine Co., the United States Concrete Co., and the John Deere Plow Co. Of these, the last named is complete, but several others are weeks from a finished state. The iron shops, intended to house arts and crafts products in iron-working, is completed, but the doors are closed and the visitor peers through a cob-webbed window to see only bare corridors and walls.

STOVE MANUFACTURERS MEET.

Marked by an unusually large attendance and a high degree of interest in the proceedings, the thirty-sixth annual meeting of the National Association of Stove Manufacturers was held at the Hotel Astor, New York, May 8 and 9.

At the election of officers the following were chosen: President, W. G. Henry, Detroit Stove Works, Chicago; vice presidents, Wm. J. Myers, Union Stove Works, New York, and Abram C. Mott, Abram Cox Stove Co., Philadelphia; general secretary, Thomas J. Hogan, Chicago; commissioner, Edward C. Hanrahan, Chicago; treasurer, J. Darl Buckwalter, Buckwalter Stove Co., Royersford, Pa.; board of managers, Ralph S. Buck, Bridge & Beach Mfg. Co., St. Louis, Mo.; E. W. Anthony, Smith & Anthony Co., Boston, Mass.; Charles A. Du Charme, Michigan Stove Co., Detroit, Mich.; Edward Bowditch, Rathbone, Sard & Co., Albany, N. Y., and N. H. Burt, Great Western Stove Co., Leavenworth, Kan.

In connection with the convention, the twenty-second annual meeting of the Stove Founders' National Defense Association was held on May 7. During the year 120 matters calling for adjustment were before the association and only three strikes resulted, a splendid record, due in great part to the wise administration of President McAfee. The following officers were elected: President, W. H. Cribben, Chicago; first vice president, Fred Will, Rochester, N. Y.; second vice president, M. B. McKnight, Reading, Pa.; treasurer, Lewis Moore, Joliet, Ill.; secretary, Thomas J. Hogan, Chicago; conference committee, W. H. Cribben, Chicago; E. W. Peck, Rochester; Abram C. Mott, Philadelphia; J. W. Emery, Quincy, Ill.; S. R. Baldwin, Pittsburg; A. W. Walker, Boston.

Grain Market Attracts Speculative Interest.

With the active wheat market attracting general speculative interest to itself, a lull appears to have fallen over security trading and the past week has been the most featureless, if not the dullest, of the present year. Price changes have been narrow, and what buying and selling movements were in evidence consisted entirely of the efforts of professional speculators. The average price of twenty active stocks moved over a range of about 2½ points. The market's conduct is interpreted to be without any positive technical advantage, except possibly as an advance toward an ultimate point of equilibrium from which sooner or later prices must undergo a decisive upward or downward movement. The monotony of the week, as regards market developments, was broken somewhat by the publication of the report of the attorneys of the interstate commerce commission touching upon the Harriman railroad interests. A quiet liquidating in all classes of securities, and especially in inactive issues, has been more clearly discernible during the week. The influence of the crop situation, it is believed, will exercise the dominating force upon the future trend of the market, and for this reason speculative interest is now focused upon the developments that portend what is in store in this respect. Much interest has centered in the outlook for money, and the course of the foreign exchange has also excited considerable apprehension during the week, in view of the advance in rates to such a point as to make export of gold to France seem a possibility in the near future. The French money market is now on a higher basis than New York. An increase of nearly $3,000,000 in the surplus reserve was shown by the New York bank statement. Loans were contracted $1,400,000, against an increase of nearly $1,700,000 in the deposits. The actual increase in the cash reserve of the banks was $3,400,000. The surplus reserve of the associated banks now stands at $11,472,675, as against $10,129,275 on May 17, 1906. Total transactions on the New York exchange during the week amounted to 2,702,946 shares, as against 3,320,400 shares last week and 4,790,200 shares the corresponding week in 1906. The sales of the calendar year to date aggregated 99,614,169 shares, as against 123,329,541 shares in 1906, and 119,358,336 shares in 1905. The bond market remains in a dull state, and this is ascribed to the effect of the newer issues and the prospect of other calls for capital. Sales of the week aggregated in valuation $5,697,000, against $6,698,000 last week, and $10,835,000 the corresponding week of 1906.

Financial Notes.

Among recent dividend declarations are the following: J. A. Fay & Egan Co., regular quarterly dividend of 1¾ per cent on both its common and preferred stock, payable May 20; Sloss-Sheffield Steel & Iron Co., regular quarterly dividend of 1¼ per cent on the common stock, payable June 1; Columbus & Hocking Coal & Iron Co., dividend of 1½ per cent on the preferred stock, payable June 1; Barney & Smith Car Co., regular quarterly dividends of 1 per cent on the common stock and 2 per cent on the preferred stock, payable June 1; Pittsburg Valve, Foundry & Construction Co., regular quarterly dividend of 1¼ per cent payable June 1; Standard Chain Co., dividend of 1¾ per cent on the preferred stock, payable June 15; Saco & Pattee Machine Shops, Boston, dividend on the common stock of 3 per cent and 1 per cent additional and the regular 3 per cent on the preferred stock, payable June 1; Ashland Iron & Mining Co., regular quarterly dividend of 3½ per cent, payable June 20.

The Sloss-Sheffield Steel & Iron Co., in its report for the operations for March and April, shows profits of $394,259, and net earnings of $352,719. Of this sum a total of $157,333 will go to pay dividends, leaving a surplus for the two months of $193,386.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. May 18	Changes In Week	Date 1907 Ann. Meet.	Stock Outstanding	Dividend Basis	Dividend Last Paid	Dividend Date Last Div. Pay.
Allis-Chalmers	11¾	+⅝	Sept.	19,820,000		.....	.....
Allis-Chalmers pr	30⅛	−1⅞		16,150,000	7 cum	.....	Feb., 1904
American Can	5⅛	− ⅛	Feb.	41,233,300		.....	.....
Am. Can pr	54⅛	− ⅛		41,233,300	7 cum	5 Q.	Apr., 1907
Am. Car and Fdy	37	+ ¼	June 27	30,000,000		2 Q.	Apr., 1907
Am. Car and Fdy pr	100	.....		30,000,000	7 n. c.	7 Q.	Apr 1907
American Loc	61	− ¼	Oct. 5	25,000,000		1¾	Feb., 1907
American Loc. pr	106	.....		24,100,000	7 cum	7 Q.	Apr., 1907
American Ship	74	−3⅝	Oct. 2	7,600,000	6	1 Q.	Mar. 1907
American Ship. pr	104½	− ½		7,900,000	7 n. c.	1¾ Q.	Jan. 1907
Am. Steel Foundries	7	− ⅛	Oct. 1	15 810,000		.....	.....
Am. Steel Foundries pr.	38	−1		17,240,000	6 cum	.....	Aug., 1904
Barney & Smith	70	.....	June 4	2,000,000	4	4	Mar., 1907
Barney & Smith pr	138½	.....		2,500,000	8 cum	8 Q.	Mar., 1907
Bethlehem Steel	12	.....	April 2	14 962,000		.....	.....
Bethlehem Steel pr	49	.....		14,908,000	7 n. c.	1¾ Q.	May, 1907
Cambria Steel	37⅛	− ⅛	Mar. 19	45,000,000*	6	3 Q.	Feb., 1907
Cambria Iron	48	.....		8,468,000*	4	4 S. A.	Apr., 1907
Chicago Pneumatic Tool	.....	.....	Feb. 18	6,145,800	6	4 Q.	Apr., 1907
Colorado Fuel	31⅛	−2⅜	Oct. 21	30,132,000		.....	Apr., 1902
Crucible Steel	8⅞	− ⅛	Oct. 16	24,578,400		.....	.....
Crucible Steel pr	71	− ⅛		24,436,500	7 cum	6	Mar., 1907
Empire Steel	8	−1	Feb. 27	2,281,400		.....	.....
Empire Steel pr	49	−1		2,500,000	6 cum	3 S. A.	July, 1906
Fay & Egan	100	.....	Feb. 19	1,000,000	6	1½ Q.	May, 1907
Fay & Egan pr	128½	.....		1,000,000	7 cum	1¾ Q.	May, 1907
General Electric	142	−4½	May 14	63,613,600	8	8 Q.	Apr., 1907
Harbison-Walker	11½	.....	Jan. 21	18,000,000	6	.....	.....
Harbison-Walker pr	73½	.....		9,600,000	6 cum	6 Q.	Jan., 1907
International Pump	25	−2	June 4	17,762,500		2	Apr., 1905
International Pump pr	79	.....		11,350,000	6 cum	6 Q.	May, 1907
Lackawanna Steel	55	+6	Mar. 13	34,971,400		.....	.....
Lake Sup. Corp	9½	+ ⅛	Oct. 2	40,000,000		.....	.....
New York Air Brake	115	−3½	June 18	10,000,000	8	8 Q.	Apr., 1907
Niles-Bement-Pond	130	.....	Feb. 6	5,000,000	6	6 Q.	Mar, 1907
Niles-Bement-Pond pr	105	.....		2,000,000	6 cum	2 Q.	May, 1907
Otis Elevator Co	35	−1	March 18	6,350,300		3 A.	Apr., 1907
Otis Elevator Co. pr	90	.....		6,308,500	6 n. c.	6 Q.	Apr., 1907
Penn. Steel	60	.....	May 13	10,750,000		.....	.....
Penn. Steel pr	101	+2		16,500,000	7 n. c.	3½ S. A	May, 1907
Pittsburg Coal Co	12½	+ ¼	Feb. 11	32,000,000		.....	Nov., 1906
Pittsburg Coal pr	55⅝	.....		32,000,000	7	.....	Apr., 1906
Pressed Stl. Car	34	− ⅛	Feb. 20	12,500,000		3	Aug., 1904
Pressed Stl. Car pr	92½	.....		12,500,000	7 n. c.	1¾ Q.	May, 1907
Pullman	168	+1	Oct. 17	100,000,000	8	2 Q.	May, 1907
Railway Stl. Spring	44	.....	Mar 7	13,500,000		4 S. A.	Mar., 1907
Railway Stl. Spring pr	94	.....		13,500,000	7 cum	7 Q.	Mar. 1907
Rep. Iron & Steel	26	− ⅛	Oct. 9	27,191,000		.....	.....
Rep. Iron & Steel pr	85¾	+ ¾		20,416,900	7 cum	7 Q.	Apr., 1907
Sloss-Sheffield	59⅛	+ ⅛	Mar. 5	10,000,000	5	5 Q	Oct., 1906
Sloss-Sheffield pr	98⅜	− ¼		6,700,000	7 n. c.	7 Q.	Apr., 1907
Tenn. Coal & Iron	146¾	− ¾	May 7	22,553,060	4	4 Q.	May, 1907
U. S. Pipe & Fdy	35½	+1⅛	June 26	12,500,000	4	4 Q.	Dec., 1906
U. S. Pipe & Fdy. pr	83½	+ ½		12,500,000	7 n. c.	7 Q.	Dec., 1906
U. S. Steel	35¾	−1⅜	April 15	508,302,500	2 n. c.	½ Q.	Mar., 1907
U. S. Steel pr	99¾	− ⅛		360,281,100	7 cum	7 Q.	Feb., 1907
U. S. Steel 5's	96⅜	− ⅛		463,798,000	5	5 A.	....
Va. Iron, Coal & Coke	1	.....	Sept. 17	3,641,000		.....	....
Westinghouse Elec	176	+ ⅛	July 24	24,998,700*	10	10 Q.	Apr. 1907
West'ghouse Air Brake	148	+2	Oct. 1	11,000,000*		22½ Q.	Jan., 1907

Par value of shares, $100, except those starred, $50.

NEWS FROM MANY INDUSTRIES.

New Buyers:—

The Virginia Iron & Metal Co., Manchester, Va., has been chartered with an authorized capital of $25,000 by Louis Burnstein and S. S. Smith.

Frank C. Albee, Washington L. Albee and Emily P. Albee have organized the J. H. Schmahl & Albee Co., Buffalo, with a capital of $10,000.

The Eastern Concrete Steel Co., Buffalo, has been organized with a capitalization of $100,000 by F. Vee Baidol, G. T. Roberts and H. W. Ellis.

The Brake Pump & Condenser Co., Fitchburg, Mass., has been incorporated with a capital of $25,000 by William H. Blake, Herbert E. Blake and Alvah M. Levy.

The Leetonia Tool Co., Leetonia, O., has been incorporated with a capital of $10,000 by H. T. Collins, W. R. Smith, J. T. Smith, C. S. Richards and M. A. Collins.

The Riverside Iron Works, Denver, has been incorporated with a capital of $150,000 by A. G. Sutherland, Robert J. Sutherland, A. G. Sutherland Jr. and Paul G. O'Brien.

The Bohnert Mfg. Co., Paris, Ill., has been chartered with a capital of $5,000 to manufacture sheet iron products by George A. Bohnert, Thomas F. Connelly and Anna Bohnert.

Articles of incorporation have been filed by the Edward A. Menzer Machine Co., Dallas, Tex., with a capital of $10,000. The incorporators are: Edward Menzer, J. B. Moses and T. W. Burns.

The Ironton Malleable Co., Ironton, O., has been organized with a capitalization of $150,000 by H. A. Martin, D. C. Davies, F. J. Ginn, E. O. Marting and F. J. Gilbert.

The Economic Specialty Co., Chicago, has been organized to manufacture machinery and mechanical devices with a capital of $20,000 by George Clark, F. W. Meddaugh and Edwin M. Wood.

The Van Meter Foundry Co., Reading, Pa., has been organized with a capitalization of $25,000 by Joseph W. Van Meter, Norristown; William J. Ogden, Philadelphia, and Edward F. Stratton, Royersford.

With a capital of $2,500 the Commercial Steel & Iron Co., Chicago, has been incorporated to manufacture rolling mill products. The incorporators are: E. D. Harrison, Simon La Grou and Marguerite Leffler.

The Patent Sad Iron Mfg. Co., East Orange, N. J., has been chartered with an authorized capital of $100,000 by Charles O. Geyer, Frank S. Ferguson and Augustus W. Condit, all of the above address.

The Lunken Steel Window Co., Cincinnati, has been incorporated with a capital of $100,000 by Edmund H. Lunken, David C. Jones, Charles M. Conklin, Louis H. Nolts, B. B. Dale and S. L. Moyer.

The Hart Foundry Co., Peoria, Ill., has been organized to manufacture castings and foundry supplies with a capital of $75,000. The incorporators are: Walter B. Wilde, George T. Page and John G. Scully.

Articles of incorporation have been filed by the Moore Foundry Co., Smithfield, Fayette county, Pa., with a capital of $5,000. The incorporators are: E. Dalefield, D. H. Baer, J. D. Moore, G. A. Moore and J. T. King.

The Standard Automatic Lubricator Co., Buffalo, has been organized with a capitalization of $50,000 to manufacture lubricating devices, and conduct a foundry and machine shop, by Charles W. Manzel, Thomas Loftus, Joseph L. Linder and others.

The Daily Malleable Iron Process Co., St. Louis, Mo., has been incorporated to manufacture and deal in iron and steel. The capital stock of the company is $10,000, and the incorporators are: M. Morris, F. M. Ester and F. W. Geraghty.

The Bay Ridge Steel Metal Works, Brooklyn, has been organized with a capitalization of $20,000 by Thomas P. Flanagan, James A. Flanagan, 672 Seventy-second street, and Julia A. Flanagan, 415 Eighty-eighth street, all of Brooklyn.

The Jamestown Motor Parts Co., Jamestown, N. Y., has been chartered with a capital of $125,000 to manufacture motors, engines, machinery and hardware. The incorporators are: Scott H. Penfield, Edwin D. Shearman, Clare A. Pickard, Edwin D. Cook and Andrew Davis, all of the above address.

With a capital of $50,000 the Shelbyville Foundry & Machine Works, Works, Shelbyville, Ind., has been incorporated to manufacture gasoline engines. The officers of the company are: Samuel J. Myers, president; William Fretchling, vice president; Franklin E. Irwin, secretary, and Wilbur W. Israel, treasurer.

The United Systems Co., Camden, N. J., has been formed to manufacture and construct steam specialties, steam heating systems, machinery, tools, etc. The capital stock of the company is $10,000, and the incorporators are: Ernest Howard Hinter, John F. Jolice and Dean Renvick, all of the above address.

The Gravity Lock Mfg. Co., Camden, N. J., has been formed to manufacture a springless gravity lock, machinery and tools. The capital stock of the company is $300,000, and the incorporators are: Thomas G. Speigelmire, McClure, Pa.; Frederick W. Culbertson, Lewiston, Pa., and Susie Lewis, Camden, N. J.

The Gadsden Pipe & Fittings Co., Birmingham, Ala., has been chartered to manufacture cast iron pipe and conduct other business in connection with the same. The capital stock of the company is $50,000, and the officers are: H. Hammond, president and treasurer; W. H. Kirkland, vice president, and J. C. Persons, secretary.

New Construction:—

The Miller Lock Co. is having plans prepared for the erection of a manufacturing building to be erected at Frankfort Station, Philadelphia.

Farrar & Trefts, Buffalo, are receiving estimates on a boiler shop 108 x 220 feet to be erected in that city. The building will be of iron and steel construction.

The Peerless Machinery & Supply Co., Wichita, Kansas, is erecting a stone structure 50 x 75 feet, adjoining the main factory building, which will be used for foundry purposes.

The Streator Metal Stamping Co., Streator, Ill., has begun the erection of a machine shop 36 x 100 feet, one story. Brick and concrete blocks are being used as the construction materials.

The American Steel & Wire Co. has awarded the contract for a one-story brick addition, 50 x 200 feet, to its Anderson, Ind., plant. The new structure will be used temporarily as a store room for barbed and galvanized wire.

The Davenport Locomotive Works, Davenport, Ia., has commissioned architects to draw plans for a new foundry to be built on property recently purchased near the present plant. The building will be 104 x 220 feet, of brick, concrete and steel construction.

The New Holland Machine Co., New Holland, Pa., is erecting a new foundry 85 x 100 feet, which will be equipped with one 2½-ton and one 6-ton cupola and other modern appliances. It is the intention of the company to increase its output from 60 to 75 per cent.

Plans for the large new addition to be built to the plant of the United

Engineering & Foundry Co., Youngstown, O., have been submitted to the building inspector for approval. The building will be three stories, 85 x 200 feet, of brick and steel construction.

The Nathan Mfg. Co., 416 East 106th street, New York, is building an addition 25 x 100 feet to its foundry building. The increased space will allow the spreading out of the present equipment, but some new purchases are being made, notably a number of molding machines.

The Reeves Gas Engine Co., Columbus, O., is contemplating the erection of a new plant to accommodate its growth of business. The officers of the company are: J. H. Holterman, president; Edward R. Reeves, vice president; John F. Reeves, secretary and treasurer, and William Reeves, manager.

The Manufacturers' Foundry Co., Milwaukee, recently organized, is having plans prepared for a large plant to be built in that city on a tract of land recently purchased by the company. Fred Devere, formerly of the Devere & Schloegel Lumber Co., has been chosen president of the company.

J. H. Newbury, Goshen, N. Y., foundryman, is building an addition 23 x 115 feet to his foundry plant which was recently heavily damaged by fire. The fire destroyed the the main foundry, shipping room and engine room and considerably damaged the machine shop building, but the equipment in the small foundry escaped intact. The roofs of the shipping room and the engine room are being replaced.

The Hocking Valley railroad has awarded the contract for the construction of the main freight repair shop at the new shops at Logan, O., to the Mt. Vernon Bridge Co., Columbus. The building will be of structural steel with a ground plan 162 x 500 feet, which will be covered with corrugated iron and will contain one 10-ton and two 5-ton traveling cranes, which will be furnished by the Case Mfg. Co., Columbus. The repair shop will contain six tracks of 12 cars capacity each, and will be most modern in every respect.

The new plant which the Charlotte Pipe & Foundry Co., Charlotte, N. C., manufacturer of cast iron soil pipe and fittings and plumbers' castings, is now building, will be very extensive and will have more than double the present capacity of the company. The main foundry building covers over two acres of ground, and the other buildings comprise extensive machine shop, pattern shop and storage warehouses. Several miles of industrial tracks facilitate the handling of material. Electricity generated by water power will be used for motive power, and in every respect the plant will be most complete for the manufacture of soil pipe. It is expected to be in operation within the next 60 days. The company has manufactured cast iron soil pipe and fittings and other plumbers' castings for the past six years, and is not connected in any way with the manufacture of brick, an item recently published having been misleading in this respect.

General Industrial Notes:—

At the annual meeting of the Pennsylvania Steel Co. the present board of directors was reelected.

The National Stove Co., Loran, O., whose plant was recently damaged by fire, reports that it will soon be in shape to manufacture steel and gas ranges.

The Fire Escape & Railing Co., Passaic, N. J., recently incorporated, has taken over a running business doing a general fire escape, cellar door and other iron business, and is located at 78 First street, Passaic.

At the annual stockholders' meeting of the Columbus & Hocking Coal & Iron Co., Columbus, O., D. M. Postlewaite and Henry Stanley Haskins were elected directors in place of F. M. Cronise and C. G. Baratt. The other directors were reelected.

The Eastern Steel Co., 71 Broadway, New York, has started the new blooming mill recently installed at its plant at Pottstown, Pa., to replace the old mills heretofore operated. The change, for the present, does not involve any important additional capacity.

The Shenandoah Steel & Wire Co., Buffalo, has started making wire by a new process at its extensive plant south of that city. The begining of the operations was highly successful and marks the completion of a plant which was built in a remarkably short time.

The Ohio Boiler Co., Girard, O., recently organized, has purchased the boiler shop formerly owned by the Girard Boiler & Mfg. Co., and is prepared to manufacture all kinds of plate and structural work. At the present time no new buildings or equipment are in contemplation.

The fire which recently visited the plant of Merritt & Co., 1024-1028 Ridge avenue, Philadelphia, manufacturers of structural and ornamental iron and wire work, caused damage principally to the stock. The total loss was about $2,000 and the firm has already made a settlement with the insurance companies.

The King Mfg. Co., Indianapolis, Ind., recently incorporated, has organized by the election of the following: President, Daniel W. Bolen; vice president, W. F. King; secretary-treasurer, J. H. King; general superintendent, J. M. King, and assistant superintendent, Elbert Johnson. The erection of a factory for the manufacture of a rotary engine, invented and patented by J. M. King, is contemplated.

At the annual meeting of the stockholders of the Jeffrey Mfg. Co., Columbus, O., J. A. Jeffrey, R. Grosvenor Hutchins, Robert H. Jeffrey, C. W. Miller and Frederick Shedd were reelected directors. The board organized by the election of J. A. Jeffrey, president and general manager; R. Grosvenor Hutchins, vice president and manager of the mining department; Robert H. Jeffrey, vice president, assistant general manager and purchasing agent, and C. W. Miller, secretary and treasurer.

The American Electric Furnace Co., 45 Wall street, New York, has taken over all the business pertaining to electric furnaces heretofore carried on by the American Gröndal Kjellin Co. of New York, and the Injunction Furnace Co., of Newark, N. J., as well as all patents relating to electric furnaces taken out by F. A. Kjellin and E. A. Colby, which were owned by these companies. The American Gröndal Kjellin Co., will continue to carry on business relating to the concentration and crushing of ores, the manufacture of charcoal and other special processes which have been developed by Gustaf Gröndal and his associates.

The Preston Car & Coach Co., Ltd., Preston, Ont., recently incorporated, is an entirely new concern organized by Don M. Campbell and Charles S. Wright for the purpose of manufacturing electric cars, automobile bodies, railway coaches, automobiles and other vehicles. Mr. Campbell was formerly superintendent of the Ottawa Car Co., Ottawa, Que., and previous to that occupied the position of chief engineer for the J. G. Brill Co. at its Cleveland plant. Mr. Wright has been superintendent of the carriage department of the Ottawa Car Co., for the past 12 years. Automobile body building will be the company's main line ultimately. Work on the construction of the plant has been commenced.

The stockholders of the General Electric Co., at their annual meeting at Schenectady, N. Y., May 14, elected the following directors for the ensuing year: Gordon Abbott, Oliver Ames, T. Jefferson Coolidge Jr., Frederick B. Fish, George L. Gardner, Henry L. Higginson, Robert Treat Paine, all of Boston. C. L. Coffin, J. Pierpont Morgan, S. L. Schoonmaker, Charles Steele, of New York; W. M. Crane, of Dalton, Mass.; Marsden J. Perry, of Providence, R. I.; J. P. Ord, of Albany; and E. W. Rice Jr., of Schenectady. Marsden J. Perry will fill the posi-

tion of director and also that of vice president formerly held by the late General Eugene Griffin, and S. L. Schoonmaker, of New York, succeeds on the directorate, J. K. Henderson, resigned. At the meeting of the board of directors, B. E. Sunny and J. R. Lovejoy were promoted to vice presidents. The other officers were re-elected.

Trade Notes:—

The F. H. Brown Machinery Co. has opened an office at 1102 Park building, Pittsburg, as a representative of a number of machine tool manufacturers. The company will make a specialty of buying and selling second-hand machinery.

The Fox Machine Co., Grand Rapids, Mich., has received an order for two No. 8 Fox trimmers, the largest trimmers manufactured, and 20 of the small No. 4 A trimmers for installation at the Stearns plant of the General Electric Co., Erie, Pa.

Pawling & Harnischfeger, Milwaukee, announce that their Chicago sales office is now located at 1241 Monadnock block. W. E. Kreamer is manager, having been transferred from the Denver office, where he is succeeded by H. N. Steinbarger. The former representatives of the Chicago office, G. P. Nichols & Bro., wil continue their own business at the Old Colony building.

The Abner Doble Co., engineer of San Francisco, has appointed Mitui & Co. to act as its sole agents in Japan and its territories, Korea, China and Manchuria, for the sale of Doble tangential water wheels and hydraulic apparatus.

Fires:—

The James F. Powers Foundry Co., Elkton, Md., was visited by fire May 9, which severely damaged the foundry portion of its plant.

The plant of the Sterritt Thomas Foundry Co., Pittsburg, was greatly damaged by fire recently. The loss was fully covered by insurance.

The main buildings of the Holbrook-Armstrong Iron Co., Racine, Wis., were seriously damaged by fire May 11. The loss is estimated at $15,000, fully covered by insurance.

The foundry of the Kingsland-Kay-Book Mfg. Co., St. Louis, Mo., was damaged $50,000 by fire recently.

The foundry of the Sharples Separator Co., West Chester, Pa., was damaged to the extent of $2,000 by fire May 11.

The plant of the Novelty Iron Works, Sterling, Ill., was damaged by fire May 8. The loss is estimated at about $10,000.

The plant of the Webster City Steel Radiator Co., Webster City, Ia., was badly damaged by fire May 13. The loss is estimated at $25,000.

The Boston & Maine repair shop, round house and seven locomotives at Woodsville, N. H., were burned recently, causing a loss estimated at $60,000.

The warehouse of the Etna-Standard plant of the American Sheet & Tin Plate Co., at Martins Ferry, O., was damaged by fire May 13, causing a loss of about $25,000.

TRADE PUBLICATIONS.

Steam Shovels.—Catalog No. 6 is being distributed by the Thew Automatic Shovel Co., Lorain, O. The catalog is 9 x 6 inches and contains 36 pages and illustrates a large line of steam shovels of various types and sizes.

Feed-Water Regulator.—The Strong, Carlisle & Hammond Co., 360 Frankfort avenue, Cleveland, has issued an instruction sheet of the feed-water regulator built by it. The sheet contains eight pages 9 x 12 inches, and gives a complete description of the construction and operation of the controller and detailed directions for installing, operating and repairing.

Drilling and Tapping Machines.—Illustrated catalog of the Cincinnati Machine & Tool Co., Cincinnati, 48 6 x 9 pages. This catalog illustrates and describes "Cincinnati" drilling and tapping machines, ranging from the 21-inch plain drill to the 42-inch heavy pattern upright drill with revolving tables. Included in the machines listed are a 4-spindle sliding head gang drill and a 4-spindle stationary head gang drill. Attachments and conveniences for the machines are also shown, including high speed attachments, drill vises, drilling plates, taper shanks and twist drills.

Presses.—"Temporary" catalog 15 has been issued by the Ferracute Machine Co., Bridgeton, N. J., and refers to nearly 500 kinds and sizes of foot and power presses for working bar and sheet metals, paper, cloth and leather. This catalog is, as its title implies, of temporary character and only intended to serve until the company's new catalog, which is in preparation, is issued. The catalog is 4½ x 6 inches, and contains 38 pages devoted principally to illustrations and tables of dimensions of the various presses manufactured by this company.

Electric Mine Locomotives.—"The Care of Electric Mine Locomotives in Service" is the title of bulletin No. 12 issued by the Jeffrey Mfg. Co., Columbus, O. This is a handsomely printed, well illustrated book of 80 8 x 10 pages, describing very thoroughly the electric mine locomotives manufactured by this company, and listing the troubles to which electric locomotives are subject. Directions are given as to the care of the locomotive in starting, running and stopping, the daily inspection and care which it should have and the general inspection and care, together with detailed directions for the care of the various parts. The troubles which may occur to an electric locomotive are minutely described, and the methods of locating and correcting the faults are presented. Considerable space is devoted to repairs on locomotives, some of the sub-heads being disconnecting and assembling, repair to motors, repairs to journal boxes, general repairs. Another section deals with operation. Tables of dimensions of the locomotives are presented and also tables giving capacities and draw bar pull. The company invites consulting engineers, mine managers, superintendents, electricians, mine bosses, machine runners, motormen and engineers not on its regular mailing list to write for copies.

Turret Lathes.—The Gisholt Machine Co., Madison, Wis. A 14-page booklet 8 x 9¾ inches. This is an unusually handsome catalog describing and illustrating Gisholt "American Type" lathes, especially adapted for short chucking work as pulleys, fly wheels, gears, clutches, etc. The lathe is built in two sizes, 27 and 32 inches swing respectively.

Lackawanna Coke Plant.—In a paper read before the New England Foundrymen's Association, by Edwin A. Moore, on "By-Product Coke Ovens and Their Field," an abstract of which was published in THE IRON TRADE REVIEW of April 25, the Lackawanna Steel Co. was listed as having 564 coke ovens. This number covers the ovens for which a contract was made by the United Coke & Gas Co., of New York. The number of ovens actually installed on account of this contract is 188. The company also has 282 ovens of the Rothberg type. The Retort Coke Oven Co., of Cleveland, also has 100 ovens of the Rothberg type which were not mentioned by Mr. Moore. Mr. Moore confined himself to the United-Otto and Semet-Solvay systems. It was not his intention to comment upon or describe any of the other types of ovens in use abroad or in this country which have been exploited along the lines of the two original systems referred to in his paper.